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JULY 1946

IN THIS ISSUE:

A Unified Engineering Profession

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A Unified Engineering Profession

By Carl L. Svensen

Delivered at the Tenth Annual Highway Engineering Conference, Albuquerque, New Mexico, March 8, 1946.

There was a time many years ago when an engineer could have a fair knowledge of the work of all other engineers. He could have knowledge and facility in mathematics, science, materials, mechanics, and methods. He could know theory and practice over a wide range of engineering work.

Thomas Tredgold's definition in the charter of the institution of Civil Engineers as "The art of directing the great powers of nature for the service of man", still holds preeminence as a definition of engineering. But the science of engineering, operating under that definition has developed with the growth of knowledge of the great powers of nature, of the materials of nature, and of the means of applying this knowledge to the service of man. This growing knowledge has brought into being the scientist engineer, the creative engineer, and the constructing engineer. And in each of these divisions there has come specialization and more specialization from civil to mechanical and electrical and then to the many and varied specializations of these and other major branches of engineering.

Progress From Specialization

The effect of this specializing is seen in the great progress which has been made in engineering, and in the acceleration of engineering development. There has been intensification of scientific research. The creative engineer has understood and applied the scientific accomplishments, and the constructing engineer has built and made available the physical improvements which have made modern civilization possible.

And now, so much of engineering is involved in the daily life of all mankind that the engineer has been called upon to manage and direct the great agencies which he has created. Engineering has become a profession but the intensity of specialization has tended to segregate engineers into technical groups of like interests. There are so many kinds of engineers and engineering societies that the public is confused and engineers see and know too little of each other and of each other's functions and of the professional aspects of engineering.

Carl L. Svensen

It is right and proper that technical groups of like interests should associate for improvement in their special field, but a profession divided, or shall we say made up of separate groups, cannot have that integrated consciousness which means so much in a unified profession.

Technical Societies Essential

The importance of the founder and other engineering societies for technical and scientific progress and the exchange of engineering knowledge cannot be overestimated. They have grown from real needs and have a place in the practice of professional engineering which can be filled in no other way. The vast and rapidly increasing scientific and applied technical engineering information requires all the efforts of such societies in the many directions now followed.

It is natural then that movements have taken place in the direction of some means of bringing engineers of all kinds together for the professional aspects common to all engineers—for some means of integrating the profession and looking after the non-technical phases. As a professional man, the engineer has a place as an engineer first, which means more than an engineer preceded by an adjective such as a civil engineer, a mechanical engineer, an electrical engineer, or any of the hundred adjectives which might be used.

Poor Organizational Forms

There have been attempts to care for the professional aspects of engineering by associating representatives of the various technical societies. Such attempts have been well meant but they have failed as professionalism has become too big a part of engineering to be cared for in any way except as one of the two grand divisions of professional engineering. *One grand division is made up of the technical and scientific aspects as represented by the founder and other engineering societies each of which represents some special branch of engineering. The other grand division is made up of the professional aspects which are common to all engineers and which provide for a unified profession of engineering* and which include:

—The engineer's responsibility to his profession

—The engineer's responsibility as a group

—The engineer's responsibility as a leader and administrator

—The engineer's political responsibility

—The engineer's responsibility—local, state and national—and yes, international!

Registration, Basis for Professional Organization

With engineering established as a profession by the requirement of legal registration in all but one state the professional aspects have made this grand division of engineering of increasing importance and makes some form of all inclusive professional association imperative. The principal factors can be stated in a few words: Ethics and practice; Legislation; Public relations, Engineering Registration; Inter-relation of engineering societies; National factors affecting the profession of engineering.

All of this is more than can be taken care of as a part of the functions of any society devoted to one of the branches of engineering. It cannot be properly taken care of by an organization which has a major interest in

the technical aspects of engineering or by representatives of such organizations.

A president of one of the founder societies, during his term of office, sensed the reality of conditions when he made the following statement in an address:

"I believe our need is for some overriding association of engineers whose purpose is to represent all branches of the profession in civic and state affairs and which is also capable of watching over the welfare of its individual members in broad issues. Such an association must be entirely independent of our technical societies which have a very definite, important and growing field of activity. It cannot be set up as a side line of the Founder Societies."

An attempt to provide such an overall representative body by the formation of the Federated Engineering Societies to function through the "American Engineering Council" was made back in 1920. It failed and passed from existence. It did not possess the vitality necessary to accomplish the primary purposes related to the professional aspects of engineering because these purposes were different from the technical aspects of the societies upon which the Council was superimposed. It was like an attempt to adapt a machine to an entirely different purpose than the one for which it was designed.

Coordination Essential

The coordination of all engineers as a purpose to be desired has been so well and so often expressed by so many that I believe there only remains the question of how it can best be accomplished. There is, then, need of a national and all inclusive engineering body—a body which can express the authority of a unified profession of engineering as do the American Medical Association, The American Bar Association, and the American Institute of Architects, for the members of those professions.

The Doctors, the Lawyers, and the Architects were either very smart or very fortunate, or both—for they each have one basic educational degree and one inclusive national society.

Identifying Professionalism

Engineers have many educational degrees and many engineering societies. This diversification has been, and still is to a large extent, a source of confusion. It has impeded the crystallizing of a unified profession of engineering. The real basis for a unified profession has developed with the passage of engineering registration laws. This has made it possible to identify the professional engineer and has given a legal status to the profession in all but one state. With this recognition has come the responsibility, shall we say duty, of the professional engineer to protect and promote the good name and proper meaning of engineering—not alone in the technical sphere, but in the greatly enhanced professional sphere—the sphere which has the responsibility for the legal, moral, ethical, and qualification elements of professional engineering.

This is too big and too important a job for the individual, or for separate engineering societies. The individual engineer and separate societies must be able to function as such in local matters and must have the active participation of the members, but in national factors there is needed the strength and authority of a unified profession must be directly related to the individual members if it is to have the vitality necessary to function as do the medical, legal, and architectural associations. The public expects doctors, lawyers, and architects to be members of their unified professional organization almost as a parallel to the possession of a license to practice. In the course of time the public and clients will come to expect a professional engineer to be a member of the unified professional society in the same way as for other professions.

Professionalism Carries Distinction

Is engineering to be properly valued as a profession, or is it to be relegated to the sphere of glorified mechanics, builders, or operators? The answer is, I believe, in a unified professional society of national scope to which all add the valuable professional elements which come from understanding and familiarity with the problems and conditions of their locality and upon which they can rely in matters of national import. Each local group gains from the experiences and support of the other groups, and these are coordinated in a unified professional society.

Engineering is being recognized more and more as the profession which it is, but with this has come responsibilities and need for the characteristics or ideals which are part of a profession. The possession or professional qualities is what has placed the leading members in high places of responsibility—not engineering education and engineering ability alone. This is a tribute to a profession which has come from association with the honest and enduring qualities of nature—materials, forces, and principles. Yes, engineering is an honored profession and rightly places more and more stress on the ethics and civic responsibilities involved in the work and activities which are a part of it. And in this is the greater need for a unified profession, with the strength and authority of a membership which can act for the individual, in the locality, in the state and in matters of national import. Beyond this, to look forward to the place of the American engineer in the engineering of internationalism of a shrinking world.

There is at hand such a society with the fundamental purpose of caring for the needs of a unified profession of engineering—a society to represent and speak of the engineering profession as a whole.

NSPE The Answer

This is the National Society of Professional Engineers which has grown in the twelve years since its organization in 1934 to 12,000 active members distributed in 25 affiliated state societies. In the larger states the state societies are composed of local chapters representing the various sections of the state. This is a remarkable growth when compared with 20,000 to 25,000 in the larger technical societies organized fifty years or more ago. And further there is the limitation of one grade of membership—that of registered professional engineers. This however will be less of a factor in the future as all but one of the states have registration laws, so we can expect that all professional engineers will be registered engineers just as all doctors and lawyers are licensed.

The National Society of Professional Engineers provides an adequate progressing vehicle which can carry the load of a unified profession of engineering. This load is described in the "Preamble" and "Objects" of the N.S.P.E.

"The National Society of Professional Engineers, recognizing that service to Society, to State, and to Profession is the premise upon which individual opportunity must be builded does hereby dedicate itself, as an edu-

cational institution, to the promotion and protection of the Profession of Engineering as a social and economic influence vital to the affairs of men and of the United States," and, "The objects of the Society shall be the advancement of the public welfare and the promotion of the professional, social and economic interests of the Professional Engineer."

The number of registered professional engineers in the United States is approaching 80,000 and can be expected to increase with the approaching universal requirement of registration. The 12,000 members do not look impressive at first glance, but when we realize that only 28 states had registration laws when the N.S.P.E. was organized twelve years ago it presents a different picture.

Great Progress Coming

The way is open for an era of progress and this society with the purpose of coordinating all engineers in a unified profession is making adequate preparations for the important purposes for which it exists. The N.S.P.E. is a live and growing organization now beginning to attract the support of many of the leaders in the technical societies as they see the non-conflicting purpose and understand the necessity of a full scale all inclusive organization to provide for the representation of a unified profession of engineering.

NSPE Policy-Program

A program of policy just formulated by the Policy Committee of the N.S.P.E. indicates truly broad and comprehensive plans for a truly representative and authoritative society for a unified profession. It is unnecessary to go into detail but a realization of the magnitude of the work to be done is evident. The need for competent and understanding specialists in certain phases of the society's activities is faced and adequate finances are proposed to get the work done. Activities for which provision is to be made include the following matters:

Legislation: Which calls for a Legislative Secretary, competent to take responsibility for legislative policy.

Membership: Which calls for a competent full time Membership Secretary to assist and advise the Member State Societies, promote new societies and to act on all matters pertaining to effective membership activities and growth.

Publication: Provision for a full time Editor for the American Engineer, one who is an expert on publicity.

Practice and Ethics: To strive for adoption of a uniform "Code of Ethics", and to develop and pursue the adoption of fee and salary schedules by the Member State Societies.

National Council of State Boards of Engineering Examiners: A joint committee of the N.C.S.B.E.E. and N.S.P.E is doing excellent work in connection with registration matters and factors which the organizations have in common.

Relationship with other Engineering Societies: A necessary activity indicating full cooperation on problems of mutual interest.

Collective Bargaining: Fact finding and study to continue on the elements which enter into this matter.

Public Relations: A primary responsibility of the Executive Director.

Legal: Employment of legal counsel qualified to give sound advice.

Engineers-in-Training: This matter to include presentation of ethical and professional matters to students in the engineering schools.

Relationship with Member State Societies: To provide for annual conference of Member State Society Presidents with necessary traveling expenses. And later annual conferences for Member State Society Secretaries.

Administration: An Executive Director and an adequate administrative budget.

An Imposing Program

All of this is indeed an imposing "Program of Policy" but one which indicates a realization of what must be done if engineering as a profession is to be preserved and perpetuated.

The N.S.P.E. not only permits, but insists, on local self government and a large measure of participation by the individual member. The individual members compose the Chapters. Chapters compose the Member State Society, and the Member State Societies compose the National Society of Professional Engineers. Thus, the engineer is a member of a Chapter, a member of the State Society, and a member of the National Society.

In a profession there must be unity and there must be professional consciousness, there must be a uniform code of ethics, there must be an acceptable minimum fee and salary schedule, there must be a basis for identification of the competent practitioner, there must be proper standards of educational preparation and of engineering practice, there must be adequate provision for the policing of the profession, there must be available competent legal and legislative counsel, and there must be coordination of effort.

State Organizations The Basis

All of this would appear to point to the desirability of functioning on a national scale. The contributions, financial and professional, of Member State Societies will make a unified profession of engineering possible in a National Society of Professional Engineers. The N.S.P.E. can be no more than it is made by the constitute Member State Societies but it can be as much as they care to make it and there is no limit, *and I mean no limit*, to what it can mean to the profession of engineering and to the individual professional engineer. The N.S.P.E. is not perfect but it has a sound basis and it provides an adequate means of progress in the right direction—the direction of a unified profession of engineering.

I have tried to present some broad outlines of a unified profession and a means toward that end—the National Society of Professional Engineers. I am sure that there is room and a warm welcome for New Mexico in the N.S.P.E. and with it the opportunity of sharing in the work to be done and in the expenses of getting the work done. Yes, it means work and money. But a profession means no more than the value placed upon it by the members of that profession.

Engineers are men of vision, of imagination and I have not attempted to answer the non-professional question of just how much it will cost and what it will mean to me—what will I get out of it. You can best envision the contributions which you here in New Mexico can make toward the building of a unified profession of engineering and you know that you can expect returns in like amount from the other Member State Societies.

Perhaps we might quote the wisdom of Benjamin Franklin when he was asked of what use are the kite experiments with lightening? He replied, "Of what use is a new born babe?" Who can tell?

The Engineer's Obligation To Society And To His Professional Organization

By C. George Krueger
National Society Director From New Jersey

Charge to the Newly Formed Michigan Society of Professional Engineers—An Address Prepared for Delivery at the Charter Meeting, May 10, 1946, in Detroit, Michigan.

Editor's Note: As it turned out, Mr. Krueger was not able to get to Detroit in time to deliver in person the address which was to welcome the Michigan Engineers into the National Society of Professional Engineers. His plane was grounded and he was forced to use the long distance telephone to convey his regrets to temporary president Stephen G. Szabo, of the Michigan Society of Professional Engineers, together with a brief message of greeting and good wishes. However, it is felt that the ideas which Mr. Krueger wished to bring before the engineers gathered at the Charter Meeting are well worth producing here. We are pleased also to be able to reproduce on the next page a photograph of the actual presentation of the NSPE Charter at this historic meeting.

Mr. Chairman and Fraters of the Profession:

It is my esteemed privilege to be here tonight at this, your Charter Meeting. I am very happy to bring you the greetings of the entire National Society, and very especially the New Jersey Society of Professional Engineers. We, in New Jersey, have looked forward to participating in this history-making gathering of yours and now that the time has come the New Jersey Society wishes you well on your journey along the road with your fellow member state societies.

It has only been possible for me to be in Detroit this evening because of the remarkable development in air transportation. I left LaGuardia Field only a few hours ago, it being impossible for me to leave my State sooner because of the urgent pressure of business. Air transportation as we know it at this moment—and it is continually changing for the better from day to day—is a remarkable example of what engineering development can provide for the benefit of man. We find the civil, mechanical, electrical, chemical, and aeronautical engineers all pooling their resources together to give us the world's most efficient form of air transportation. Such are the marvels of collective engineering application.

C. George Krueger

But actually it is only possible for me to be here because of the development of the engineering profession. Were it not for the fact that after due consideration you have chosen to ally yourselves with the rapidly growing National Society of Professional Engineers, my presence in Detroit tonight would not have been an eventuality despite the offering of air transportation and its implied applications of engineering principles.

Attributes of Professionalism

On this particular occasion, we might well ask ourselves what value professional development has for the members of our profession. Wickenden in his recently published article entitled "The Second Mile" has very aptly and clearly set forth the attributes which mark off the corporate life of a group of persons as being professional in character. First, there must be a body of knowledge in the sciences and arts. Next, an educational process based on the sciences and arts. Third, a standard of personal qualifications for admission to the Professional group. Then a standard of conduct based on courtesy, honor and ethics. Fifth, a recognition of status, and last an organization of the professional group. It is important to continually remember that these six qualifications must be entirely complied with to gain recognition as a profession. Omitting any would result in disqualification. Waiving aside for the moment the body of knowledge, the educational process, the standard of personal qualifications, and the standard of conduct, we might further inquire into the importance of the remaining two attributes, namely, recognition of status and the organization of the professional group, to determine whether or not the professional engineer really has a responsibility in those directions.

The fact is often lost sight of that when a professional engineer receives a license to practice from the State, he is actually obtaining a monopolistic privilege from the public in return for which the professional engineer has a debt to pay. He must protect the public at all times against unfair practices and be ever on the alert to safeguard life, health and property. By so guaranteeing to the public the trustworthiness of its practitioners the profession receives from the public protection from the incompetent judgment of the layman.

Engineers' Welfare Protected

The organization with which the professional engineer must be concerned if he is to fully qualify as a professional man furnishes the very necessary medium to provide an outlet for society idealism or society influence. The Professional Society furnishes the means whereby a professional engineer may safeguard his occupational and economic welfare against unethical practices, the indiscriminate use of the title engineer and all influences which might undermine public confidence in his integrity and competence. Wickenden further points out that the professional engineer needs the protection of the professional society against sub-professional groups seeking to act for engineers in the

various phases which make up the economic welfare problems. It supplies for him the benefits of prestige which are brought up through group publicity. It provides a collective instrument for shaping public policy in the realm of his responsibility.

Technical Societies Not Enough

It has been recognized that the technical societies have their proper and rightful place in the realm of engineering. But there are considerations pertaining to professional betterment and development, economic welfare of the individual and the community that transcend the limited fields of specialized branches of engineering. It is at this level that the professional society, representing the comprehensive field of the professional engineer, has a rightful place. The growth of the National Society since its inception over a decade ago is but an indication that the urgent need for the over-all professional type of organization is becoming more and more recognized.

Upon completion of organization details, you will be concerned with membership on an enlarged scale. You will find a condition or attitude existing among licensed professional engineers that is somewhat similar to the characteristics of employers where industrial safety is concerned. There are three types of employers; a small number who far exceed minimum safety requirements and are leaders in the field; a large number of employers who must be shown why safety is necessary and when convinced, readily comply with all requirements; a few who will not comply under any circumstance except the threat of litigation or actual prosecution. And so it is with society membership with the insertion of an intermediate group.

A small number understand the true value of the professional society and form the nucleus of the organization. The great majority must be convinced, but when they see the light, they become staunch members; a small number, exhibiting the inertia to any change that is an inherent characteristic of some engineers, will resist all efforts of persuasion until the yield point is reached—at the expense of considerable effort and patience,—even in this group some good material will develop; a few will not participate under any conditions.

Predicts Michigan's Future

Being mindful of the improvements in organization at the national level, of the more effective media at the disposal of the National Society for disseminating pertinent information and lending guidance and drawing largely from my experience in New Jersey I shall undertake to make certain predictions for the Michigan Society of Professional Engineers, which I am certain will be fulfilled.

You can readily expect a membership of more than five hundred within the next two years.

Within twelve months, the activities will have established a headquarters office with an executive secretary.

Within twelve months, the activities of your society will require the publication of a society journal.

At the next meeting of your State Legislature you will sponsor new legislature affecting the practice of professional engineering in your State.

You will actively participate in the economic affairs of your State of Michigan and local matters pertaining to the general welfare of your respective communities.

At the 1949 Annual Meeting of the National Society of Professional Engineers, you will be represented by at least two National Directors, and I predict that the 1949 Annual Meeting of the National Society of Professional Engineers will be in Michigan.

Duties and Responsibilities

On this very eventful occasion, it becomes my duty as director of the National Society to charge the Michigan Society of Professional Engineers with solemn duties and responsibilities in consideration of the receipt of a National Charter.

As professional engineers, jealously guard your professional prerogatives and zealously maintain your professional status.

Forever and always uphold professional integrity and singleness of purpose, never failing to lose sight of the high ideal of your calling as a noble profession.

Remain firm in the belief of the greater effectiveness of the triune professional organization, the local chapter, the State Society and the National Society, each supreme at their respective levels yet thoroughly interdependent.

Be ever mindful of the responsibility which your State has placed upon each

(*Continued on Next Page*)

New Michigan Society Receives NSPE Charter

In the above picture the NSPE Charter is being presented to Stephen G. Szabo, (center) temporary president of the Michigan Society of Professional Engineers, by Mr. Alex Van Praag Jr., (left) one of the vice-presidents of NSPE. Mr. L. E. Peterson, (right) National Director from Wisconsin, assisted in the ceremonies and in getting the new Society off to a good start.

Ethical Status of the Kansas Engineers

By Lester T. Hagadorn

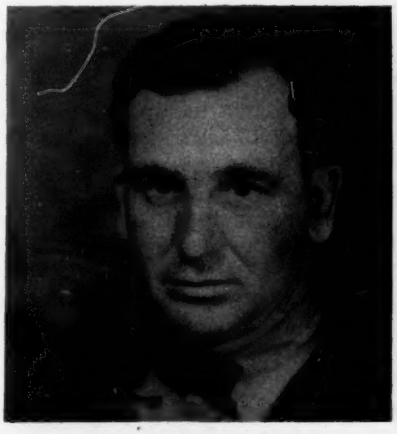
An address delivered before the North Central Kansas Highway Officials Association, at Beloit, Kansas.

It is interesting to note that in the Foreword of the Fourteenth Annual Roster of Professional Engineers in Kansas for 1945, this comment is made. "At the present time forty-six states, four territories and Canada have laws covering the registration of professional engineers. In all but Kansas the practice of professional engineering except in subordinate capacities is restricted to registered professional engineers. Although Kansas Statutes do not make the registration of professional engineers compulsory and place no restrictions upon employment of engineers who are not registered, the active cooperation of the engineering profession and of the public and private agencies which employ engineering services is resulting in a gradual raising of the standards of engineering services, which is of mutual benefit to every citizen of Kansas."

Accomplishments The Thing

It is not my intention to talk to you today on whether an engineer should be compelled to register in order to practice engineering. I would like to bring this group what the engineering profession is accomplishing in Kansas from the standpoint of its engineering work. It has become quite a common practice for city engineers to call in for consultation and advice engineers who have made a study of particular engineering problems.

For instance, the firm by whom I am employed is now acting as consultant on engineering problems for the cities of Hutchinson, Manhattan, Wichita, Newton, and many others who employ engineering staffs. But they realize that the work to be properly done requires the full cooperation and study not only of those who are familiar with local conditions but also with those who have wide experience in similar work. It is only after a full and complete study, that a workable and economical solution to their municipal problems can be put in operation. I do not mean to imply by my remarks that the engineering forces of these municipalities are not competent from the engineering standpoint, but in many instances outside engineers do provide a vital and welcome help to these cities.



Lester T. Hagadorn

Mr. Hagadorn is a charter member and Director of the Kansas Society of Professional Engineers. He is a graduate of the Kansas State College; a Registered Civil Engineer, specializing in Sanitary Engineering, and is a Senior Engineer in the firm of Wilson & Company, Salina, Kansas, one of the leading consulting Engineering firms of the state.

Engineering Profession Compared

Since the postwar program has begun, we have been in contact with several counties in assisting and advising in the secondary road program. Other engineering firms are doing likewise. In the last few years there has been a marked trend in the engineering profession to work as a unit. Out of this trend has arisen various organizations. The engineering profession has made great strides as a profession but there is still a great deal to be done.

How Professional?

I sometimes wonder if we have a profession. Let us look at some of the other professions in the state, take for instance the medical profession. When a student graduates from a medical school ready to take active practice in the field, he has to experience a solemn ceremony of pledging his conduct to a code of ethics. It is under this code of ethics that he is judged by the medical profession. In the bar association there is a similar environment. Even registered nurses of Kansas in the conduct of their practice, abide by a certain code to which they have pledged

The Engineers' Obligation

(*Continued From Previous Page*)

ot you in return for which you have a perpetual debt to pay to Society.

Be also mindful that your continued moral and material support of your professional society is in part payment of your debt.

Support your chosen officers loyally and be respectful always of the will of majority.

President Szabo Praised

And to you temporary President Szabo, I reaffirm the esteem with which the New Jersey Society holds you in highest regard for the untiring contributions that you made for the professional engineer in our State.

Although New Jersey feels the loss of your inspiring efforts and leadership, and your understanding of professional appreciation very deeply, your former society gladly makes this sacrifice in order that you may pursue a still more fruitful, more successful course of action in the great State of Michigan.

I charge you, therefore, to earnestly and sincerely support your president in this important period of your existence, the better to enable you to continue the important work of your State Society in a manner consistent with the demands of your profession.

In awarding a charter from the National Society to the Michigan Society of Professional Engineers, I have one more thought to leave with you:

Working Together

All have a share in beauty,
All have a part in the plan,
What does it matter what duty
Falls to the lot of man?
Someone has blended the plaster,
And somone has carried the stone;
Neither the man nor the master
Ever has builded alone.
Making a roof for the weather,
Or building a house for the King,
Only by working together
Have men accomplished a thing.

The End

themselves. In the engineering profession, we have similar codes.

Engineers have a code fostered by the four Founder Societies, namely the American Society of Civil Engineers, The America Society of Chemical Engineers, the American Society of Mechanical Engineers, and the American Institute of Electrical Engineers. There is a code of ethics by the Registered Professional Engineers of Kansas. There are certain requirements set up for the conduct of the members of the Kansas Engineering Society. There are also requirements and standards set up by the Kansas Society of Professional Engineers. These codes of ethics are similar and may be obtained and read by engineers that are interested and not members of these various groups.

Engineering Codes

At the present time, we have a number of engineers practicing in the State of Kansas who do not belong to any of these mentioned organizations, therefore the code of ethics of the engineering profession does not cover the entire field of engineering but only those individuals who belong to the various engineering organizations. There seems to be a void in the engineering profession for those members of the profession who do not belong to some engineering organization.

The code of ethics should cover the following relationships:

The engineer's relationship to the public.

The engineer's relationship to his employer and employee.

The engineer's relationship to his client.

The engineer's relationship to the contractor.

The engineer's relationship to other professions.

I would like to discuss briefly these relationships.

The engineer should seek to promote public welfare by safeguarding lives, health and property, and by improving the social and economic status of mankind. The engineer should not become associated in any manner with enterprises which are contrary to public welfare or are of questionable, speculative or illegal character. The engineer should assist the public in arriving at a clear understanding of the technical phases of public questions. The engineer should discourage and challenge untrue, unfair and exaggerated statements on technical subjects, especially when such statements may lead to unworthy and uneconomical public enterprises.

The engineer should give consideration to the effect on the community of the proposed project with which he is concerned. The engineer should advise the public of the requirements, responsibilities and accomplishments of the engineering profession. The engineer should support public officers in the enforcement of regulations applying to the profession and should take an active interest in the formulation and enforcement of such regulations. The engineer should see that credit for engineering work is given to those who are the real authors of such work. The engineer should give full, faithful and loyal service to his employer. The engineer should not divulge any confidential information obtained from his employer. The engineer should protect his employer's interest in every legitimate way. The engineer should inform his employer of any business connections, interest, or affiliations which might influence his judgment or impair the quality of his services.

Professional Standards

The engineer should not solicit or accept professional employment from others in addition to his regular work, except with the knowledge and approval of his employer and other parties concerned. The engineer should not accept employment with another employer without giving his present employer due notice. The engineer should realize his limitations and if advice is needed, consult, retain, or cooperate with experts and specialists. The engineer should help his profession in the following ways: He should cooperate in exchanging information and experiences with his fellow engineers, and by contributing to the work of engineering societies, technical press and by encouraging engineering education.

The engineer should recognize properly qualified engineers as members of his profession and should extend to them courtesies and considerations not inconsistent with his practice, nor injurious to his personal interest. The engineer should render assistance and encouragement to engineering students and to young engineers. The engineer should not seek to displace a fellow engineer after steps have been taken towards his securing employment.

Engineers are frequently called upon to deal with contractors. Such relationships place certain obligations upon the engineer which he should consider binding. He should deal fairly with the contractor in all relationships, and should in his judicial capacity as an arbitrator between the owner and the contractor, act with the highest ideals of fairness and honor. He should prepare plans and specifications in such a manner that they are definite and specific. He should conduct lettings fairly and openly and in general he should open bids and read them publicly in the presence of the bidders who desire to be present.

He should promptly furnish the contractors with such information as is necessary for the proper carrying out of the contract and should promptly give any decisions on matters affecting the progress of construction. He should not require the contractor to furnish material or do work not clearly called for by the plans and specifications. He should require full and complete performance of provisions of the contract, plans and specifications. The engineer should respect the qualifications of other professions and should not encroach upon their field. He should cooperate with other professions in order to obtain satisfactory services for the client or employer.

The engineer should, when acting as an expert witness or in discussing professional matters, base his statements only upon adequate knowledge and honest convictions. The engineer should place service to mankind above personal gain and use his engineering knowledge and skill that it may benefit humanity.

Standards Must Rise

The statements that I have just read sound nice and no doubt you are wondering what connection they have with my previous remarks regarding the standards of engineering that Mr. MacDonald criticized in Oklahoma, and in that portion of the foreword of the roster which stated that the engineering profession and the general public is gradually raising the standards in Kansas. I need not ask you what would happen to an attorney guilty of malpractice, nor do I need to discuss the fate of a doctor guilty of the same, even to the nurses' profession. They are subject to discipline and the cancelation of the right to continue practice if they violate certain standards of ethics. These professions are so governed that any violation of ethics can

(*Continued on Page* 20)

The Engineer in Public Service

By Leonard N. Thompson

Delivered Before The Senior Class, Institute of Technology, University of Minnesota.

On four previous occasions you have been addressed on subjects covering the Engineer's place in and his responsibilities to society; his professional ethics; his registration to practice as an engineer; and, a subject which has been both vital and debatable particularly during the past year, his relation to labor laws and labor organizations.

I now propose to discuss the engineer in public service. Papers to follow will discuss the subjects of private practice and administrative organization. If we are still able to keep all these word pictures in proper focus, we should have a pretty fair idea of what you may be doing and the problems you may face in the next few years. Of course we all have set ourselves up as experts, by implication at least, and have tried to leave absolutely no impression that we ourselves started out in our practice with just as much and probably a lot more mental confusion than you men may possibly have today as you attempt to study the beginning of a professional career.

Public Service as a Career

Each of you by now, I assume, has pretty well fixed in your mind the particular kind of engineering that you hope to follow and probably entertain some hope or inclination towards a particular type of employment. I hope very sincerely that a few of you are looking forward to a career as an engineer in public service. I hope to be able to stimulate some interest in that service and I hope further that the day is not too far distant when more specific study can be given to the general and administrative duties that an engineer will encounter in such work.

If your thoughts today are typical of the thoughts of all engineers who have graduated before you the big question mark is where and how will you start application to the job and kind of employment ahead. It sometimes takes a lot of shuffling before we finally by chance or choice land in the particular niche our peculiar talents seem most fitted for, or in which we finally find the personal satisfaction which results in rendering the greatest service, or which comes as the result of personal satisfaction. In this shuffling process, I have seen Civils practicing as Mechanicals, Mechanicals practicing as Civils, Designers become Administrators, Office Engineers Field Men, and Field Men Office Men, etc., which is indicative of the initial confusion we sometimes face before we get settled down and stay put.

Leonard N. Thompson

Mr. Thompson is a native of the State of Minnesota, having been born in St. Paul, in the year 1888. *Graduated from Ripon (Wis.) College in* 1911. *In* 1912 *he entered employment with the St. Paul Water Department. On April* 1, 1945 *he was made Superintendent of that Department.*

Mr. Thompson served as a Lieutenant in the Coast Artillery in the first World War. Later he spent one year as designing and construction engineer with the Building and Grounds Section, U.S. Air Service, Washington, D. C., and Richmond, Va.

In 1945 *Mr. Thompson was elected President of the American Water Works Association in which he has long been active.*

With the Minnesota Federation of Architectural and Engineering Societies, he served from 1938 *to* 1942 *as Director of the State Board, and in* 1943 *he served as State President.*

In addition to all of the above activities, he has taken time to serve as President of the St. Paul Engineers Society, and in 1940 *helped organize and served as State Councilor and State President of the Minnesota Association of Professional Engineers. He is also a member of the A. S. C. E.*

Luck vs. Ability

What we men have presented as a preview for you to look at is but a resume of our own personal experiences and observations. Where the hand of fate, or luck, or inclination may finally place you is of course anybody's guess, but once there, only ability will hold you there. At the moment I happen to be engaged in the field of municipal engineering—specifically in the water supply business. Why I got started in public service work was, I think, largely a matter of chance or luck. I say luck because I have so thoroughly enjoyed it, and with the exception of a few side trips into private practice, contracting and government service, I always seemed to return to this type of work. How I got started was probably due entirely to the fact that I was young, inexperienced, obtainable at the wages offered, all of which may or may not qualify me to speak on the subject.

We have in this state today about 1,250 registered civil engineers. How many of these men are engaged in some one of the many types of public service, i.e., municipal, county, state or federal engineering, etc., I have no way of knowing. If I did, it would probably not be a good index, since the large majority of those so employed are not registered or required to register as not in responsible charge. The total engaged in public works and utilities is, however, I suspect, quite a sizeable number. It has increased very fast in the past few years, particularly among engineers employed by the Federal Government and our State Highway Departments. I should say, and again this is just a personal guess, that the big percentage of these men are Civils, with probably a fair percentage of Mechanicals and Electricals. In general the average engineering office of any public department follows, I believe, quite closely the pattern of a private engineering office, with the usual employment of draftsmen, designers, field men and engineering administrators, with possibly a little more opportunity for a variety of

work to be done by the individual than in detailed specialization.

Public Employment Status Rising

I don't believe that there is any question but that the status of all public employment has been upward over the past 15 or 20 years and is still going to higher levels and gaining in public esteem. Certainly I can well remember, and you men can still occasionally hear, disparaging remarks relative to public service; when employment by a city or state or federal department at once conjured up the idea of a soft job, probably obtained and held by "pull" with no reference to ability.

This stigma was not attached to the professional jobs in such a general manner as it was given to the more usual type of employment, yet the general implication did leave some unfavorable sting to all types of public employment, deserved or not. There are probably a number of reasons for this favorable change in public thinking, but probably the main one is growing public education and public interest in our governmental functions and appreciation of the fact that public services constitute a big business, that the men are being employed to run our own official business and we will get the kind of results from that business according to the type and abilities of the men we hire to do the job. Unquestionably we are attracting into public service a much higher class of men each year.

So if any one of you ever considers public employment on the basis that you know some one who knows some one who knows the mayor, just forget it because you wouldn't last long anyway. I hope to see the day when we will have career service-men, trained for public employment, employed in every instance entirely on the basis of their training and retained only on the basis of ability. And we are pretty close to that time right now. So it is without any reservations at all that I can recommend a public service career to any one of you, should your talents and inclinations point that way. There is today and always will be a need for high grade competent engineering talent in all public services.

Security One Attraction

What does this kind of work have to offer? The factor that has probably played a bigger part in raising the character and ability of men so employed is the same factor that offers the greatest inducement to enter such service, i.e., reasonable security of employment. This security has largely been accomplished first, due to the fact that public works construction is today looked on with greater favor during periods of depression and other types of public engineering are usually required through both peaks and valleys of national economy; and secondly, through the proper administration of Civil Service regulations and elimination of the old so-called spoils system.

Most employment by federal, state and municipal departments today is secured through the medium of Civil Service, that is by competitive means, fair and honest selection, and the tendency today, more particularly in obtaining our technical help, is to base original employment and advancements entirely on the basis of ability, experience, training and education, as determined by written tests alone or a combination of written tests and other evidence of fitness. Due, in a large degree to the interest and help of organized professional engineering groups, such as our own Minnesota Association of Professional Engineers, most Civil Service classifications today are so intelligently broken down, as to set forth the proper grades of the engineering jobs, with proper minimum qualifications, proper specifications, and with a reasonable semblance of correctness in the relative salary scales set for each grade.

Very few instances occur today in which employment with any public service, except of course in privately owned public service companies, is obtained except by proper application and by passing specified civil service tests, and the interest of engineers in our standards and rates of pay for engineering jobs has seen a marked improvement in such Services during the past few years.

Job Classifications

Some general reference to a few typical job classifications in one or two Civil Services may be of interest.

In the City of St. Paul, which has developed over many years a very good system, and one in which I have acquired a fair working knowledge, all jobs, whether engineering or not, are grouped under nine so-called services. I shall refer here of course only to engineering positions, and our interest is in what is called the "Professional & Scientific Service" and the "Subprofessional Service". Each of these two services is divided or broken down into a number of different grades, and classified under these several grades according to importance, responsibility, etc., are grouped all titles professional or subprofessional as the case may be. To each grade, which may include one or several engineering titles of equal importance, is assigned a standard base rate of pay.

For example under the subprofessional service we find six engineering jobs are listed under different grades. The lowest engineering classification so listed is the title of Rodman, which is under Grade I, with an assigned pay scale of $126 per month entrance to $156 maximum. Similarly in Grade 5, we find the title Jr. Engineering Draftsman, $174.10 to 207.10 a month, and so on to Jr. Civil Engineer in Grade 7, at $184.95 to $220.95; Instrumentman and Asst. Testing Engineer in Grade 9 at $203.500 to $244.

Similarly also in the Professional Service, which brackets the more responsible engineering jobs and has listed 14 different positions, the lowest engineering title is Sr. Engr. Draftsman in Grade 5, at $213.70 to $257.20; Asst. Civil Engineer in Grade 6 at $235.95 to $285.45, Sr. Asst. Civil Engineer in Grade 7 at $260.05 to $317.05, and so on to the top grading of $6,000 per year in Grade 11.

This is rather typical of most systems, difference in the many systems of course being in the titles used, the job description, qualifications, and of course, the assigned pay scales which that particular city or agency pays.

Highway Department Jobs

The State Highway Department of course, has a very large number of job titles ranging, just to name a very few, from Rodman, through Field Inspector, Testing Engineer, District and Division Engineers, Bridge Engineer, Planning, Safety, Maintenance, Construction Engineer, etc., up to the Chief Engineer, these being grouped, as I recall, into eight classifications from Engineering Aide 1 and 2, Civil 1, 2, 3 to 7, etc. with pay scales which range from $144 to $174 for Engineering Aide 1 to $578 for Civil Engineer 7.

Employment specifications should be, and almost universally are, attached to each kind of job, such specifications indicating certain education requirements, training, experience, etc., which

are required as a prerequisite to employment or to taking the examination. Entrance into a Civil Service job is almost universally at the minimum rate indicated and advances are made to the maximum rate either at the discretion of the department head or automatically, and only after certain stated lengths of employment, which is usually 6 months. Under the St. Paul System, for example, you would reach the maximum salary allowed for your job in a period of 5 years.

As a sample of the usual type of job specifications, I have selected and quote from one given for the position which is listed under the title, "Assistant Architectural Engineer". The Duties and Responsibilities are stated as follows:

Qualifications Required

Under general supervision, with limited latitude for independent or unreviewed action or decision, to perform important routine professional work, somewhat different in character, in the designing and planning of buildings and other structures; and to perform other related work as assigned Examples of work are given thus:

Following principally plans and methods already established or prescribed by superiors, but with some responsibility for developing working details for carrying out plans and programs, and with responsibility for the accuracy as to tests, observations, measurements and computations.

To design and produce complete working drawings of buildings and other construction projects and to assist in the preparation of specifications; to inspect such projects in the field if and when required to do so. And Minimum Qualifications are noted as follows:

College graduation with course in architectural or structural engineering and three years' experience in a practicing architect's or construction engineer's office.

So far I have indicated one of the benefits of public service. Other benefits, other than security, not discussed but still very beneficial and not generally found in private employment, are sick benefits, retirement provisions, and often very attractive group insurance; and the opportunity to advance from one grade to a higher grade when openings occur, entirely upon the basis of fitness, ability and, of course, the willingness or desire to get ahead.

Financial Inducements Compared

It is just possible that you may at some point show a slight interest in the financial inducements that will be offered you if you get to the point of considering public employment. Some index as to the wages paid has been given previously but I would like to add that in general, certainly in normal times, I believe, that the remuneration for technical men in public service is lower than is paid by private industry for similar work; particularly is this true and to a much greater degree in the more responsible jobs, let us say the top jobs. Of course, this must be considered and remembered: The compensation paid for the average engineering work in private practice is more responsive to that tough old law of supply and demand.

For some time now we have been riding the crest and engineers are in demand, but not too many years ago, and I am sorry to have to say this, I was employing a number of good engineers on W.P.A. jobs. This variable pay scale to engineers based on availability rather than worth, of course, is unfortunate but is gradually, I feel certain, being overcome as engineers have become more group conscious, appreciative of their own value, and are gaining greater public esteem.

On the other hand, the wage level in public service when established and controlled by Civil Service rules is probably much more stabilized,—in good times below the private scale, and in bad times often above that scale. I know from experience that in times of prosperity those engineers in public service clamor for higher wages and in times of depression those men who have followed private employment clamor for Civil Service jobs.

Variety of Experience Offered

As to the type of engineering work or experience you might hope to find in public service, I previously remarked that I believed you might find more variety here than under private employment. Running mentally through such jobs, we find hydraulic engineers, sanitary engineers, paving, construction, mechanical, electrical, chemical, highway engineers, surveyors, estimators, designers, etc. Outside of a relatively few consulting engineers' offices, the engineer in public service employment has, I believe, in his earlier years an opportunity for a much wider field of general engineering practice experience. However, I may be in error in trying to draw any general conclusion.

I have been asked to make some remarks on the social attitude of the engineer, which I think I shall very simply define as the engineer's everyday relationships with his fellow Americans, i. e., his public relations, and, since this general discussion has been in particular reference to public service employment, I should confine and continue these observations to the engineer in such service. However, since I know no reason in the world why there should be any distinction, I propose to now include all engineers in the following remarks. Perhaps the truest criticism that we can direct at ourselves is the fact that we try to go in two directions at the same time.

Good Public Relations Important

As a group engineers have for years set themselves up as a profession shunning publicity, refusing to talk the layman language or to take other than a purely professional interest in even the simple problems of living. At the same time, however, we are now demanding greater public recognition, and better pay, and what we claim as our proper part in the direction of affairs, our policies, and all matters which effect the lives of men. The proper understanding and appreciation of the engineer's social attitude, or in other words what constitutes good public relations, is one of the greatest needs of the profession today. To appreciate how we complicate this relationship, listen to this definition—"It, i.e. public relations, is the science of attitude control, the means by which every phase of human endeavor is keyed to man's want and brought to and sustained in public favor." Now doesn't that sound just like an engineer's attempt at something he doesn't know a thing about. It might rate you pretty good in an examination but in actual practice, "no dice". The trouble is we try to make it look too hard and complicated when in reality good public relations is a relatively simple thing. It isn't advertising or self-praise but just doing a job well and then telling people about it honestly and fairly for the sole purpose of arousing sincere and friendly interest in our work.

Give as Well as Receive

Of course, it must embrace the thing we so often forget—it requires giving as well as receiving. You can't take without putting; the more we give to public service, the more we take away.

As an individual engineer or as a group our measure of success, publicly acknowledged, will largely be determined by what we contribute to the betterment of our fellow men over and beyond just our purely professional services. Why are engineers today becoming increasingly conscious of the need for professional organization? For professional advancement and personal gain through collective effort? Well, this may be, and probably is, the end result desired, but that result will be accomplished only as a natural sequence to the main job of developing in each of us a basic and sincere desire for public service. The application of engineering abilities to the common problems of better living.

Good Leadership in Demand

Never in our history has there been greater opportunity for good leadership and straight thinking. Sound engineering is 90% good judgment. When we apply the principles of human engineering to our everyday practice, the social attitude of the engineer, and his public relations, will go a long way toward solving his economic problems.

To you as an individual engineer, and to the entire profession, this implies a good reputation. It will be a protective measure against adverse legislation, will result in stability of employment, the attraction to the profession of the highest class of personnel and then, and only then, a higher level of compensation.

Must Learn to Talk Well

It has been my own personal observation that the most noticeable personal fault we all possess, and perhaps the deficiency that keeps us out of public view more than any other one thing, is the inability to stand on our feet and express ourselves. We are taught to think straight, to apply this training to our jobs, but not to express it. We too quickly depreciate our own abilities to do so. We take too literally the old advice—to be seen, stand up; to be heard, stand up; and to be appreciated, sit down. You should by some means develop the ability to speak and give expression to your work. Peoples convictions cannot rise above their understanding. If, therefore, you desire sound and harmonious public relations, you must be prepared to develop that understanding.

Mr. Franklin Thomas, Vice-President of the ASCE, recently wrote a letter on public relations for engineers which expresses so much better the story I have tried to tell that, at the expense of some repetition, I want to quote him:

Personality Counts Heavily

"Engineers, by the nature of their training, develop an intellectual integrity which becomes inherent, and such a quality might well be generously represented where matters of public interest are under consideration. I have observed repeatedly that where engineers have personal qualifications for acceptable social and personal relations with other men, associated with the intellectual abilities which we expect in successful engineers, their qualifications and usefulness are invariably recognized and they are given positions of responsibility and leadership. Character and ability are the basic qualifications which engineers have to offer, but personality is the quality which will serve as the vehicle whereby the other qualities may be made effective and the usefulness of the individual very greatly enhanced.

"I have a very high regard for the value of engineers to society and for the service which they do and can render, but I know that the usefulness of engineers as a whole would be greatly enhanced if they as individuals were personally equipped to make themselves felt with their respective associations.

"If young engineers more generally would qualify themselves for such participation in community interests and then would do their part in developing the contacts, there would be much less occasion for moaning that the engineer's abilities were not appropriately recognized —for through normal associations his usefulness would be apparent and his services would be called upon."

In such a program our colleges have and are today accepting a major responsibility. If you consider that your duties have been satisfied when the technical development has been accomplished, you are remiss in your obligation to complete an engineering course suitable to the greatest usefulness.

The engineer in training is faced with a future literally bristling with opportunities. The proper social attitude is as much of his personal equipment for meeting success as is his academic training.

Post War Economic Facts

During World War II, public savings were $145 billion, compared with $27 billion in World War I.

Currency in circulation at the end of the war we are trying to get over, was $6.7 billion, against $7.2 billion at the close of the next preceding war.

Balances in check accounts rose from $27.4 billion at the start of the war to $69.1 billion at the close. This is compared to figures on the World War I of $10.1 billion and $14.8 billion.

The cost of World War II was $301 billions, nearly all of it borrowed by Uncle Sam. That is about 9½ times the cost of World War I.

Most stocks are today selling at almost as large a multiple of dividends paid, as was the case in the boom period of 1929.

Chester Bowles reports that after the Revolutionary War the purchasing power of the American dollar fell to 33 cents; after the Civil War to 44 cents; after World War I to 40 cents. After V-J Day the purchasing power of the dollar was 76 cents.

It is obvious that if the value of the dollar is permitted to sink to around 40 to 50 cents, which is more or less "normal" for post war periods, those who possess "real wealth" will suffer least. The big losers will be those who hold "dollar claims on wealth." These are the owners of bank accounts, the holders of mortgages, bonds, and all "dollar credits." Those who own real estate and other forms of tangible property can "hedge" on inflation. Others cannot.

Atomic bomb experts are said to fear "the political management of science." There are businessmen who fear the political management of industry, meaning "government interference with business." Sometimes we wonder why nobody comes out with a "fear of political domination of social and governmental affairs."

The political party out of power always insists that the increase in the federal debt is due to "profligate spending." They insist that tax rates can be reduced if only we cut out wasteful and unnecessary spending. Strangely enough no such critic has ever been known to accept the challenge to indicate "just at what spot should the cuts in expenditures be made."

Engineers' Professional Problems

By Walter Hall Wheeler

A lecture delivered before the Senior Class, Institute of Technology, University of Minnesota, February, 1946.

OUTLINE OF LECTURE

The Engineer in Private Practice (Consulting)

(*a*) *Design* (*Municipal-Waterworks, etc., Corporation, Building, Machines, etc.*)
(*b*) *Research* (*special problems*)
(*c*) *Maintenance*
(*d*) *Financing of Engineering Projects*
  (1) *Governmental* (*taxes, Bond issues, fees*)
  (2) *Private* (*Securities, stocks, bonds, preferred stock, security exchange commission-laws, Interstate Commerce*)
(*e*) *The engineer's integrity and conscience.*

That is the outline that I have been asked to cover. However, Dean Johnson and the chairman of the committee who took a leading part in arranging for this series of lectures have given me the privilege of departing from the outline and I am going to take advantage and approach the subject along somewhat different lines.

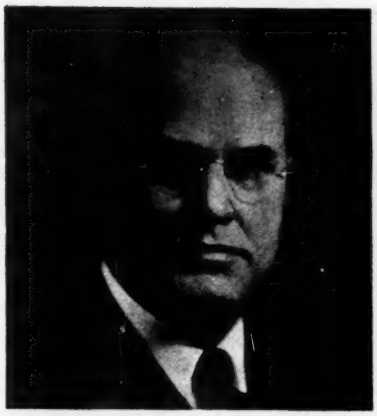
Three Types of Practice

What is the private practice of engineering? One might jump at the conclusion that it consists in setting up an office, hanging out a shingle and and waiting for clients to appear. It is broader than that. It might be divided into three main groups.

(1) The shingle type, where one does what I have indicated; establishes himself in an office and offers his services to the public. He would have to have a certain background of experience, enough money to finance himself, and some knowledge of business transactions plus his technical knowledge and some of the know-how of getting clients. His clients would probably be those individuals, businesses and public bodies who have need of the type or types of service which he is prepared to render, and who have no engineering organization of their own to perform such service.

(2) The consultant who is a specialist in his field and whose clients are mostly other engineers, engineering organizations and industries who find it advantageous to make use of his special knowledge and broad experience to supplement their own facilities. Obviously, before one can function successfully in that field, he must have an established reputation and broad experience.

(3) Corporation practice, as the chief engineer, assistant chief or department head in the engineering organization of a private corporation; or as one of the principals in an engineering corporation or partnership.



WALTER HALL WHEELER, E.M.; Mem. Am. Soc. Civil Engineers; Mem. and former director, National Society for Professional Engineers; Mem. Am. Concrete Institute & Standard Building Code Committee of A.C.I.; Registered Professional Engineer in N. Y., Ohio, Iowa, Minnesota. Registered Structural Engineer in Illinois; Registered Civil Engineer in California; Registered Professional Architect in Minnesota; Qualified by National Bureau of Engineering Registration as Professional Engineer; Member Minnesota Association of Professional Engineers, Engineers Club of Minnesota (Past President), N.W. Section A.S.C.E. (Past President) Sons of the American Revolution (past president Minnesota), Mayflower Society; Graduate University of Minnesota, School of Mines '06; Mining & Construction Engineer, Colorado Fuel & Iron Co., Trinidad Division; Construction Engineer Dawson Fuel Co., subsidiary Phelps-Dodge Corp., Dawson, N. M.; Secretary, office manager and chief engineer, Jones-Wheeler-Cramer Engineering Co., Engineers & Contractors, Denver; private practice with headquarters in Minneapolis since 1912; Buildings, Bridges, Industrial Plants; Inventor "Smooth Ceilings" System All Flat Slab Construction for Buildings; Author of numerous technical papers; Presbyterian; Recreations, canoeing, fishing, hunting.

Steps to the Goal

How does the young graduate determine whether his field shall be private practice and whether he is personally fitted by qualifications and temperment to engage in it? If private practice is his goal, how shall he reach it? When a ship captain plans a voyage he must know where he is going and decide upon the best course to reach his objective. When a civil engineer plans a road, he must know the points to be served by the road and determine the best route and location. When a chemical engineer undertakes the development of a new product he must know what end product he is to produce and develop the process that will best accomplish it, and so on.

Regardless of the objective, the logical procedure is much the same in general; namely, assemble and correlate all available factual information upon which to base decisions. If the information is not available it must be developed. That is the way one should approach a decision as to whether or not he should attempt to enter into private practice. It is my purpose to outline briefly some of the salient points to be considered.

Personal Qualifications

What are the personal qualifications needed for success in addition to education and experience? Many of them are the same as those required for success in any practice of engineering, but the need for them is more acute.

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(1) Ambition to succeed, and one might add that it must be unlimited and unflagging.

(2) Determination. One may have ambition without determination. Both are essential.

(3) Integrity—Honesty. Honest with one's self. Honest with one's clients. Honest with the public. The practice of engineering is a public trust and one must constantly keep

in mind the public interest. You may recall the lines from Hamlet, "This above all, to thine own self be true; and it must follow, as the night the day, Thou canst not then be false to any man." Such a creed is absolutely essential for success in private practice.

(4) Responsibility—Reliability. This is not the same thing as integrity, but allied to it. One can have perfect integrity without having much responsibility. I do not refer to financial responsibility, necessary as that is. It goes without saying that one must be in a position to finance himself and pay his bills. I mean the type of responsibility which prevents one from undertaking a commission or assignment unless he knows that he has the ability and the will to carry it through to a successful conclusion. Further and even more important, that he shall address himself to the task and see it through to the best of his ability. That he shall not allow himself to be diverted from the task in hand by other projects that may seem to be more interesting and alluring. Regardless of how small and unimportant the job, once undertaken, that he will give it his best and be satisfied with nothing less than perfection. This brings to mind that old saying, "That which is worth doing at all, is worth doing well." It requires years of hard and patient work to build a reputation as a reliable and successful professional man. The finest reputation can be wrecked by one careless or false step.

A Wise Caution

(5) Avoid cock-sureness. Keep your mind open. Always be ready and willing to receive suggestions from others and to consider and examine them. No one mind ever possessed all of the knowledge of a given subject. Lessons can be learned and ideas gotten from the humblest workers on the job, if one is awake and receptive.

(6) Never stop educating yourself. Affiliate yourself with technical and professional groups. Associate and work with your fellows for the advancement of your profession and the improvement of yourself. Read and study. Profit by the experience of others. Happy is he that can and does do that, for he will save himself many bad hours and disagreeable experiences. One should not, however, become narrow-minded, but should seek to expand his knowledge, understanding and abilities and to make himself into a more useful citizen as well as more useful to his profession. The two are inseparable. No one can reach the highest pinnacle of professional success who permits himself to become narrow and bigoted. You may have heard one definition of an engineer; "one who knows more and more about less and less until he knows practically everything about nothing." I can assure you that it belongs to the "horse and buggy era." The modern definition combines scientific attainments with broad general knowledge, the living of a well-rounded life and participation in the life and activities of his community and nation.

Your Profession Before Money

(7) One should have a deep-seated love of his work, respect for himself and his profession and enthusiasm. If engineering is just a job, just a way of making a living, I do not advise you to go into private practice. You will probably not like it and probably not be successful. If one is looking for a soft spot to rest in, he should avoid private practice. Doubtless you will recall the story of the tramp who proclaimed that he was not afraid of work, he would lie right down beside it and enjoy it. That is not the road to success. For the most part the practice of engineering is just plain unvarnished work and especially so with private practice. One should not worry too much about the clock. There are too many other fellows who never think about the time, only the job they are doing. Those who are too concerned about the time will find themselves taking their dust and eventually out of the running.

So much for personal qualifications. Ask yourself if you have them. Now I would like to mention some of the fields of endeavor which are open to private practitioners and some which are closed or partially closed.

Drawbacks of Private Practice

The private practice of engineering is suffering from most of the ills of other private enterprise, and particularly from the encroachment of government. Some lines of activity which were wide open when I started out, are now virtually closed. Bridge engineering is one of them. Practically all highway bridges are now designed and supervised by public bureaus. Privately owned toll bridges have been largely eliminated by restrictive legislation, which allows an inadequate return on the investment if the investment is successful and leaves the owner to take the losses if not successful. Railroad bridges are usually designed by the engineering staffs of the railroads by men in corporation practice. To a greater or less degree the same situation applies to all public works, federal, state and municipal. The trend is definitely in that direction. Only the smaller communities seek the services of private practitioners. Consultants are sometimes called in by the larger communities, states and the federal governments, but the tendency has been toward the development of self-sufficient engineering organizations. I see no indication as yet of a reversal of that trend. Private industry is more inclined to call in private consultants to help them with their more difficult and unusual problems or to supplement their own staff when called upon to handle a larger amount of work than they are prepared to undertake with their own forces. That field is also narrowing. As small industries grow into big industries, they are inclined to build up large and efficient engineering organizations of their own and to rely less and less upon outside help. Private citizens or groups of citizens sometimes join together in undertakings that require the services of engineers, and they normally employ private practitioners. Some engineers become expert witnesses in litigation and are in demand for that service. Some who have an unusual amount of business acumen, develop industries and commercial enterprises of their own or become the heads of large industries.

The Field is Narrowing

To sum it all up, the field is narrowing, and will probably continue to do so. There will be occasional spurts of activity like the present, when the engineers in private practice will be called upon to fill the gap and render the services that industry's own staffs are unable to handle. There will probably continue to be a rather limited and restricted field for the private practitioner as long as we continue as a free nation. His best hope of survival seems to be in corporate practice. Large contracting companies have been reaching out into the field of the private practitioner in the construction industry, both architectural and engineering, forcing the men in those lines in some instances to become their employees. This again, is corporation practice.

These are all matters which must have your consideration if your goal is private practice. Let it be said, however, that the United States grew and became great because the people who settled it hungered for liberty, the right to be their own masters, the right to establish and own a business and to govern themselves. Fortunately that spirit still survives in the minds and hearts of many Americans. Regardless of the difficulties and obstacles which

confront them, some of these people will carry on and derive a degree of satisfaction from their accomplishments which cannot be measured in terms of tangible assets. If one has the necessary qualifications and the determination to succeed it can be done, and the rewards in terms of satisfaction are great.

I have no desire to discourage anyone who wishes to enter private practice or to erect bogey men in his path, but I would like to spare you bitterness and disillusionment, and to let you know what some of the problems are, so that you will go into it with your eyes open. In fact I would rather be too conservative in presenting the difficulties so that if you do set that as your goal, you will be better prepared to meet them. Forewarned is forearmed.

Getting Started

Now let us assume that you have made the decision, that you have prepared yourself, gained your reputation, acquired sufficient funds and are ready to engage in private practice. What do you do? Let us also assume that you have been engaged by a private industry as their engineer. They started with an idea, protected by patents, and built up from nothing, until now they have a large and growing business. They have added space to their factory as new demands came upon them. They did not follow any well thought out plan, and they could not do so. They could not foresee just how their development would proceed and they were forced more or less to just grow like Topsy. Now they have reached maturity. They have a sprawling plant. Their manufacturing costs are high. Their product needs improvement to meet the new competition that has been developing. Their financial structure needs overhauling and simplifying.

In military language it is time for them to consolidate their gains. During the push forward to success, they did not have much time or ability to do anything but keep moving. You may not know much about their particular business, but because of your broad experience in industrial work and your reputation they have engaged you to help them to re-organize their plant and their whole set-up. It is not likely that they will want your advice about their financial structure, business policies, sales policies, etc., but it is quite likely that they will expect you to have a speaking acquaintance with such matters so that you will better understand the problems which you are expected to solve for them, and what they are trying to do.

Must Know Your Job

How do you proceed? The answer, of course, is get all the available facts and data that are pertinent to the problem. How do you do that? Usually when such a program is undertaken, the job of handling it for the industry is assigned to the executive vice-president or some other high official of the company and he becomes your contact man. It might be the engineering department of the company if it is large enough to have one. It might be the general manager. It will be someone in authority. You will sit down with him and go over the situation, obtain all the information from him that you can, make notes of all important points, examine the plant, acquaint yourself with the business, take the information you have gained back to your office and study it. As your study progresses you will have questions to ask of your client. Go back to him as often as is necessary, but be careful not to make a nuisance of yourself. When you need information, be specific about what you want, get the answer or answers and get out promptly. Go over the plant a number of times, until you have it fully in mind.

When you think you have all of the information that can be had in this way, you should be in a position to make recommendations as to what studies should be made, and what tests conducted, what research should be undertaken to complete the information which you will need to make definite recommendations as to plant alterations, expansions, changes in product, changes in equipment and machinery and operations to accomplish the results desired. When that time comes you will prepare a comprehensive report, with estimates of cost of the work you propose and estimates of the cost of operations and production after the work has been done. Very likely you will need to illustrate your recommendations with drawings, sketches, graphs, etc.

Sell Your Ideas

Your next job will be to sell your program to your client through your contact man. He is the first one you will have to sell. Very likely you have been told in the beginning, at your first interview, how much the company is prepared to spend, and what end results are to be achieved. If, you are convinced that it cannot be done, you will have to say so and prove it. If you are convinced that it can be done you will have to prove that, and you will also have to prove that the product is going to come out as you say it will and that the cost of manufacture, will be within your estimates, as well as the cost of alterations, additions and new equipment.

Very likely you will have to revise your recommendations and estimates a number of times before the contact man is willing to approve them and recommend them to the officials of the company. They will probably hold a meeting or several meetings and go over your report and recommendations and try to tear it apart. If in the end they accept it, it will still have to go through the Board of Directors and have their approval. You will undoubtedly be called upon to defend your report both to the officials and to the Board. If the Board approves it and authorizes the expenditure, you are on your way and can then proceed with det il plans and specifications.

While you are working on such a project you must get yourself into the frame of mind that this is your business or your industry. You must be able to view it from the inside as well as outside and have as much interest in its success as the officials and Board of the company have. Otherwise you will not be able to function as you should.

Be Concise—To the Point

Another thing to keep in mind is that you are dealing with busy people. Keep your reports, recommendations and communications just as concise and to the point as possible. Set them up so that they can be readily understood. Avoid verboseness and generalities. Follow through in logical order to your conclusions and put your supporting data in the appendix, properly reference and indexed so it can be found readily, but where it will not clutter up the report proper. The executives want to know what you propose to do, in general how you propose to do it, how much it will cost, and what the results will be after the job is done. Most of them will not be interested in the details of how you propose to do it. Some of them will be deeply interested in that phase of your report, and they should be able to find all of the information they need in the appendix.

If the work involves the setting up of new processes and the operation of new machinery and new methods of handling the product, it is quite possible that you may be called upon to supervise the operations until all bugs are out of the system and everything working smoothly. A job of this kind can cover months or it can cover years. It can proceed consecutively and orderly, or it can proceed in one or two steps at a time. A lot will depend upon the situation in the industry and the business. The management may not want to interrupt operations just at the time you are ready to do so. All of this must be planned out carefully in advance in complete detail so that changeovers can be made with the least inconvenience to the plant operations. The program must also be coordinated with financing arrangements.

Anticipate Economic Angles

After all of your studies have been completed, the company may decide that the investment is not justified, that it will not earn a satisfactory return, in which case the whole project may be dropped and nothing be done, or an entirely new approach to the problem may be studied, or several different approaches, before one is found that meets the requirements.

Keep in mind that when you are working for private industry, your problem is to evolve a plan which will produce satisfactory returns on the investment, otherwise it is not likely to be adopted.

If the project calls for an entirely new plant, some of your problems will be simplified, but others will be intensified, because you may not have the benefit of operating experience to guide you. In such cases, pilot plants may be required to prove the process or processes, and a vast amount of research and experiment carried out before you will be in a position to make and support definite recommendations. You will be fortunate if you can make all of your errors on paper where they are easily corrected and before they become liabilities in the form of brick mortar and machines.

A Government Job

Now let us consider a totally different project, a sewage disposal plant, or a waterworks system for a municipality. In such a situation you will be dealing with public bodies, boards, councils, etc. The city may or may not have a city engineer and staff. If it has, your problem is somewhat simplified as he will be in a position to assist you in dealing with the board or the council. There may or may not be men on the board or council who have some knowledge of the subject. There may be a division of sentiment, some in favor of the project and others opposed to it. Naturally you must have a working majority on the board or council. If there is a division of opinion, the outs will be watching for openings to attack the project and you may find yourself the butt of public criticism, through no fault of your own. You will have to watch your step and be sure of your ground at all times and above all, avoid taking sides on political issues.

Part of your job will be to so conduct yourself as to win the respect of the opposition and if possible win them over to your side, by the force and clarity of your presentations to the board or council. Of course some people are just naturally stubborn and refuse to be convinced or to accept facts regardless of how well they are presented and how sound they may be. If you encounter that kind of situation, all you can do is live with it as peacably as possible and go through with your work. If you do find yourself in such a situation and conduct yourself at all times openly and above board and with absolute frankness to all concerned you will very likely win their respect at least, and that is worth all the effort that it takes to accomplish. Such situations are not unknown in private corporations.

I recall one project which I worked on with the general manager of the company. When he was ready to bring it before the board of directors I was asked to be present. I went there in total ignorance of the real inside situation. I presented my report to the Board and found that I had landed in the middle of a dog fight. It seemed at the time that it would be hopeless to get the warring factions together. Their wants and ideas were at the opposite poles. However, by careful work and by paying attention to both factions I was able to work out a plan that met with the approval of all and the plant was built and everyone was happy and proud of the result. Thus we can add to the qualifications of an engineer in private practice that he must also be something of a diplomat and understand human relations.

Cultivate Diplomacy

On a public project, the engineer is often called upon to exercise diplomacy and to bring warring factions together and iron out difficulties which are less likely to arise than on private projects. Such activities may absorb as much as half of his time. On public projects the engineer may also be called upon to set up the financial program, prepare assessment rolls to spread the taxes over benefited property, assist in presenting the project to the voters, in addition to all of his other duties. Prepare advertisements for bids, tabulate the bids, make recommendations as to award of contracts. At all times he must be sure that each step that is taken is in accordance with the laws governing public projects. There are many legal restrictions that have been set up to safeguard public funds in the public interest and these must be meticulously followed to avoid serious complications and difficulties. It is important that estimates be ample to cover the cost, especially where these estimates are the basis of bond issues for financing the project. It is extremely embarrassing to go through the motions of setting up the financing, getting the bonds voted, and then find when the bids come in that there is not enough money to complete the project.

Awarding Public Contracts

In the award of contracts legal requirements must be carefully followed, otherwise a contract may be held by the courts to be void. I recall one case that occurred in Ohio, where a county let a contract for the construction of a bridge. The low bidder substituted another design for the one which the engineer had prepared, with the full approval of the engineer and the county board. The bridge was built at a cost of something like $150,000.00. Then it was discovered that the contract was illegal, and although the county had received the benefits and had value received, the board was powerless to pay the contractor. Eventually the matter had to go before the state legislature to get authorization for the board to pay the contractor. Such incidents are embarrassing to everyone concerned and should be carefully guarded against.

Aside from such points as I have mentioned the general approach to a public project is not particularly different from the approach to private

projects. The profit motive is usually absent, but the interest of the taxpayers of the community is there and must be reckoned with in its place.

Plans Must Fit Conditions

Every engineering problem, public or private should be approached on the basis of the facts of the situation and treated as a separate and distinct problem. The day when an engineer can go to his plan file and pick out plan "A" and say this is it, has long since passed. Projects may be similar, but rarely are the conditions exactly alike and it is extremely dangerous to assume that they are.

In closing, I would like to discuss briefly and very generally the principal means of financing engineering projects. Volumes have been written on the subject. Days could be spent in discussing the various plans. I will try to point out the main features and you will pursue the subject further in your reading and home study. It is important to have a working knowledge of it. 1*st* Government projects, and this includes federal, state, county and municipal projects. Federal projects, like all other public projects usually originate with the citizens of a district. They furnish the push to get something started. After that the government department or agency concerned may take it up and help promote it.

Take the Columbia Basin Project in the State of Washington for example, better known as Grand Coulee now. Citizens of Washington had been demanding and dreaming of it for at least 25 years before it materialized. From time to time engineering reports and estimates were made, some by private engineers, but mostly by the Bureau of Reclamation. The final solution and site of the project was entirely different from the first conception of it. Before any studies could be made by the Bureau, it was necessary for Congress to appropriate money for the studies and authorize them to be made. Eventually the site was selected, estimates of the cost were made and appropriations requested and authorized to pay for the project.

Government appropriations are made from the funds in the Treasury Department or funds that it is anticipated will be there when they are needed. These funds are collected from the citizens and the industry of the country, by levying taxes of one kind or another, some of which are concealed and said to be painless, others that you recognize when you buy a package of cigarets or make up your income tax report. If the money is not in sight from these sources, the government issues bonds, which are in effect a first lien upon all the property and assets of all the citizens of the country, in proportion to the rules laid down by the congress. The federal government does not issue revenue bonds for specific purposes as far as I know. All bonds are general bond issues. There are no prior lien bonds. They have different maturity dates. but are all what might be termed general and first mortgage bonds.

The funds received from the sale of bonds and from taxes and from other sources are allocated and budgeted to the various projects, and if the projects are of the self-liquidating type or income producing type these appropriations may be reimbursed to the Treasury Department over a period of years after operating expenses have been deducted. We do not have Boulder Dam Bonds, T.V.A. bonds, etc., issued by the Federal Government. The money comes out of the general fund and goes back into the general fund, and we all share in the obligation.

In recent years the Government has established lending agencies, the first of which the Reconstruction Finance Corporation, which was set up during the Hoover Administration to make loans to private business, industry, banks, etc., which could not be obtained from private lending agencies. These lending agencies have been greatly expanded since the R.F.C. was set up and especially during the last war. The government also went into the financing business for states, counties and municipalities, both through grants and loans. I will not attempt to name them all. The money all comes out of the same pockets.

Local Financing

Financing by states, counties and municipalities differs from government financing in that bond issues may be made against specific projects, but as a rule the bond issues are the general obligation of the state, county or municipality. There are some exceptions, where the bonds depend upon the taxes and revenue derived from the specific project for their interest payments and retirement. In the last analysis, however, all government financing, depends upon the power to tax the property of the citizens. These taxes are sometimes called rents, fees, etc., but they are still taxes.

Financing Private Projects

The private project must stand or fall upon its own merit. It has no power to tax. It can collect its revenue only from its customers, be they consumers of power or groceries. It must rely upon its own credit for its ability to finance its projects. Private financing may be divided into four general classes. 1. Bank loans. 2. Bond issues of which there is an infinite variety. 3. Preferred stock. 4. Common stock. Generally speaking bank loans are for temporary financing and are not used for permanent financing or for financing permanent improvements, except temporarily, until the permanent financing can be arranged.

Using Bank Loans

Banking loans are usually made only upon the quick assets as collateral. Until recently banks were not permitted to make loans on real estate. I am referring to commercial banks. Commercial banks must keep themselves in a liquid condition and prepared to meet the demands of their depositors. Mortgage loans are made by savings banks, insurance companies and investment bankers. If the loans are large they are usually set up as bond issues secured by a mortgage on the property. The bonds may be held by the lender, but as a rule they are offered to the public. The mortgage bond issue is a favorite method of financing permanent private improvements. Bonds may be first lien general mortgage bonds, second, third, fourth mortgage and so on, or they may be equipment bonds, revenue bonds, ets.

As before stated there is an infinite variety of them, but in all cases the security must be there to guarantee the payment of the interest and principal. Preferred stock is a special class of stock, which has a prior claim on the assets and revenue of the corporation after any prior liens in the form of mortgages and other debts. It is in a preferred position with respect to the common stock. It usually has a par value and a redemption price and pays a fixed rate of dividend provided the dividend is earned, dividends may or may not be cumulative. It does not have the privilege of foreclosure against the property, if it fails to pay dividends or principal.

The common stock represents the equity interest in the property over and above the mortgages other debts

and preferred stock. Its value depends upon the prosperity of the company and the dividends it pays. It generally carries with it the control of the corporation. Financing by a going concern with an earnings record extending over a period of years is quite a different matter from financing a new enterprise. A new enterprise must usually be financed in the beginning by a group of individuals who get together and form a corporation, put up the money and take stock in the enterprise in exchange for their money. Under certain conditions a new enterprise may be financed by the sale of stock to the public or by a bond issue.

Government Regulation of Securities

Financing of private enterprise is subject to rather rigid supervision by the Securities and Exchange Commission of the Federal Government and by the so-called blue sky laws of the various states. These are rather recent developments in legislation for the protection of the public. In addition there is the Interstate Commerce Commission of the Government which must approve of any financing by the railroads. The purpose of such legislation may be worthy, but it has hampered the financing of private enterprise in many cases. Blue sky laws have been in existence for some time, but the S.E.C. is a development of the recent depression. The financing of private enterprise with certain exceptions must be approved by it before their issues can be offered for public sale. It exercises rigid control over the capital structures.

The final thought which I would like to leave with you is that the successful conduct of private enterprise is becoming more and more of a complex problem.

"Protection" Can Be Overdone

The S. E. C. law and blue sky laws are intended to protect citizens against their own folly and ignorance in making investments. It is a serious question how far government should go in that direction. Too much protection has a tendency to weaken the moral fiber and destroy self-reliance and initiative. Legislation which hampers private enterprise may destroy or weaken the national economy. The cost of getting S. E. C. approval for capital issues has made it almost prohibitive for smaller business. If the issue is less than $300,000.00 S.E.C. approval is not required, but notice must be filed with S. E. C. before it is offered to the public. Up to $300,000.00 can be sold per annum without S. E. C. approval. If an issue is placed with less than 200 people S. E. C. approval is not required. If a Minnesota corporation makes an issue and offers it only in Minnesota, there is no limit to the amount, but, of course it must be approved under the Minnesota law.

The present tax laws which tax the earnings of corporations and then tax the income of individuals received in the form of dividends from these corporations, in other words double taxation, have been discouraging to the investment of venture capital in new enterprises. Such matters should be of concern to engineers because they directly affect their opportunities for employment.

The End

EDITORIALS

Recognize the Engineer — For What?

One of our readers wants us to write an editorial on "Recognition for the Engineering Profession." He suggests that we enumerate some of the profession's accomplishments for which Engineers should receive recognition. Our correspondent believes that the mere recognition of Engineering as a "profession," is "not enough, desirable though that might be."

We are glad to attempt this assignment, and would welcome further comments and suggestions from our readers. Among the fields in which wide public recognition should be accorded the Engineering Professions, we suggest the following:

1. Engineering should be recognized as a profession open for the practice of engineering only to individuals possessing the proper personal qualifications as to integrity, education, and practical experience. The profession should be open only to those with an abiding sense of social responsibility for the consequences of their skill in the practice of the profession.

In this connection, Engineers want the kind of public recognition which gives protection against unfair and unethical competition of incompetent persons. They also want the *public* protected against the dire consequences of allowing the inexperienced or poorly trained attempting to practice the profession.

2. Engineering should be recognized as the profession which is undoubtedly responsible mainly for that part of America's physical greatness, "for which no citizen ever voted or ran for public office," i.e., the creation of such modern conveniences as power transportation, communication, heating, cooling, lighting systems, plus our marvelous highways, buildings, bridges, homes. Such indispensible gadgets for the home, factory and office, taken all together, make up the greater part of the "American Way of Life," which is fundamentally different from and better than the life to be found anywhere else on earth.

3. Engineering should be recognized in the field of social service as the creator of things that *work* dependably, that *actually perform* the kind and volume of service which is expected of them. Perhaps no other profession, be it that of medicine, law, politics, or economics has had such a small proportion of failures, and such a preponderance of success resulting from its operations, as the Engineering profession.

4. And looking to the future—to a world staggering as it is today, under the weight of intolerable insecurity and almost universal chaos—to what profession other than that of the Engineer, can the people everywhere look for practical leadership, for planning, for some coherent workable design for increasing over-all production and scheduling coordinated distribution? The American public should recognize its need for the services of professional engineers in the field of social service and social planning.

And finally we would say that for this country's own salvation in a physical sense, the public needs to give this latter kind of recognition to the Professional Engineer. For through that recognition will come the solution to our major economic and political problems.

The Engineer has planned and organized production in this country in a truly marvelous manner. There is every reason to believe that the same

engineering approach, the same organizing skill, the same technological methods will be equally effective in eliminating the disastrous and utterly unnecessary bottle-neck of distribution. Distribution is the inescapable corollary of production. Our past failure to face this issue, is responsible for the stifling of progress and prosperity, especially in America.

In short, the Engineering Profession is now looking for new worlds to conquer. That quest is fully justified it would seem, on the engineer's unbroken record of success in every situation in which the science of engineering has been permitted to function unhampered by unrelated interference controls.

The Affirmative "rests its case." Is there any rebuttal?

Engineers Awake!

Representative Carl Hinshaw, believed to be the only civil engineer in Congress, told the American Society of Civil Engineers at a recent meeting, that engineers have no right to criticize lawyers or others for the way they conduct the affairs of the Nation, or of their own municipalities, if they—the engineers—have no part in efforts to improve government."

"Stop sitting back and waiting to be consulted," he said. "Take the initiative in seeking attainment of desirable objectives."

"To achieve his highest usefulness to our society," Congressman Hinshaw told ASCE, "the engineer himself should achieve authority in the affairs of society. The reason that the ordinary or garden variety of politician attains public office, is because better-equipped men shirk their responsibilities as citizens . . ."

—From the West Virginia Engineer.

There are shrewd judges of political matters who are also engineers, who believe that Professional Engineers can best clean up present tragic political situations, by taking a hand in public affairs *as engineers,* rather than by becoming politicians. The question has more than one side. It needs more discussion through the pages of the American Engineer.

What the world needs is a form of cooperation among individuals and among nations, to harness the forces of nature for the common good. Such cooperation would make for peace, not for war.

National Issues — Washington Economic and Political Front

Events in Washington have been moving with extreme rapidity during the past few weeks. In the main we have the picture of a government with its many departments, conducted for the most part by men with little or no training for the vast responsibilities which they are expected to carry, and which as a rule they avoid whenever possible. On top of that we have a government so poorly organized that all key figures have to deal with more important questions than any man should be expected to handle with judgment and dispatch.

The one personal quality which rates above all others in government offices, is "loyalty to the chief." In order to gain that kind of unquestioned devotion, the "chief" stands behind his subordinates whenever that is possible so long as he gets loyalty in return. Stupidity, inefficiency and downright negligence of the public interest are always forgiven, often rewarded with promotion, but failure to support the boss and all his acts, is not tolerated. That, of course, is "politics", at its worst, and perhaps also at its best. When we understand how our political set-up functions, we can get some conception of why one man gets a big job that he seems utterly unfitted for, and why the best types of ability never get far.

To understand clearly just why the railroad strike was handled in one way and the coal strike along a different pattern, we'd have to go into the question of personal likes and dislikes, as well as into the whole system of interlocking friendships and loyalties, up and down and across the board. The one element you wouldn't find anywhere in the picture would be—the public interest. That is the field for the "idealists" and the "social scientists," (they have a shorter and uglier word for them in government circles) to play around in.

Scarcity Incorporated

Production is at a high peak in many lines. Due to the present uncertainty as to what Congress is going to do with and to Price Control, many lines are not flowing freely into the market. Everybody knows that producers have held back goods that are scarce on retailers shelves. Nobody likes to say much about it, because they dislike to appear critical of what is a "system"—a business system, which unquestionably puts private gain ahead of public good. Nobody is quite sure what can be done about it. Not so long as the public (which is the chief sufferer) feels that our system is the best that can be devised. This is another phase of "being loyal" to something which isn't working in the highest public interest—not on the surface at least.

Of course, there are those who think they have a scapegoat—in the Administration. The O.P.A. is blamed for scarcities, because producers will not sell at the maximum prices allowed. Nobody really knows what is going to happen when price controls are released. Many express opinions admittedly "wishful thinking," because their interest is in larger profits, not lower prices.

Here is what is apparently a direct conflict between private and public interest. There are well grounded economists who believe that our economic problem at the moment is not high prices, but surplus buying power in the hands of large numbers of people. These economists argue that a high level of buying power, widely distributed, is unlikely to cause a wide distribution of goods over any considerable period of time. The tendency, say these authorities, is always to push up prices to a point where this heavy buying power can really buy relatively little. These economists refer to our system as a "scarcity economy," for the reason that usually when we have plenty of goods we do not have enough money. When we have plenty of money, prices normally will rise to such heights that the amount of money most persons have, is still not enough to enable them to buy much at the inflated figures. The solution may be a long way off. No responsible authority has yet offered any reasonable answer to the problem. There are plenty of recriminations, against some part of the government, against greedy businessmen, against an abstract something or other, usually of a metaphysical nature.

Inflation Breeds Strikes

One thing is certain, if prices in general rise, with the lifting of price con-

trols, another round of strikes is inevitable. No one believes that any type of legislation can possibly curb labor trouble based on the usual economic causes. Economic causes are difficult to fine, or to incarcerate in the "Bastille."

International problems are difficult to interpret and especially to forecast on any long range basis. Reporting of the news relating to the U.N., as well as all controversial questions, both domestic and foreign, keep the casual reader in an impenetrable fog. American newspapers have their "untouchables" in the news, although such matters often are the determining factors in domestic as well as in international affairs.

The Baruch recommendation for international control of atomic energy is considered wise. If this is rejected, it will be because of the same old hidden power politics, the truth about which is never told in any company where it is essential that nobody's feelings be hurt.

Russia continues to be the international Bad Boy. She feels that she is the world's No. 1 isolationist—in the sense that her system is feared and hated by at least 75 percent of the nations of the world. Russia feels that the voting record of the Nations at San Francisco, London and Paris proves her contention that on a purely ideological basis, she will be outvoted on every issue which vitally affects her interests. Russian diplomats regard the so-called democracies as in reality essentially fascist. This inasmuch as they have consistently appeased and built up fascist and nazi regimes, both before and after the war. Russia claims that much of the propaganda against her is indistinguishable in content and spirit from that put out by Hitler and other fascists. It is in such an environment that efforts to make peace stumbles and falters. The truth is that neither side is honest and frank enough to meet the issues raised by the other. The democracies refuse to discuss their alleged crimes, quite as much as does Russia.

A political move is under way in Washington aimed at giving the voters a clean-cut issue of left wing or right wing, in the 1948 elections. Many shrewd politicians would like to arrange this, if it could be done without splitting the democratic party vote. After all, they say, the issue that eternally divides men in their thinking is the question of whether we progress or go in the other direction.

The old line politician, however shuns clean-cut issues. His favorite spot is astride the political fence, with both ears to the ground. Anyone who tries such a position will find that an awkward one to maintain for long.

From where we sit it now appears that economic conditions may play the major part in deciding so-called political issues from now on out. Just in case we get real inflation in this country, it is certain and many big shots in both parties are on their way out for good. The economic bungling in Washington is becoming intolerable, even for those who mistakingly think that sort of thing works to their personal advantage.

Ethical Status

(*Continued from Page 8*)

be and is properly punished. Is this true of the engineering profession of Kansas?

A Concrete Case

I would like to answer that question by giving you an example of what recently happened in our state. An engineer was engaged in engineering work assisting a city in Kansas on some projects. This particular engineer was from out of the state, but could have been a resident of Kansas. This engineer had made the surveys, completed final plans, let the contract, and the contractor had completed construction of some of these projects. The Office of Price Administration investigated the contractor because he paid above ceiling prices for some equipment incorporated in the work. Through this inquiry it was found that this engineer had purchased the equipment directly from the equipment company and resold the same to the contractor at a higher price, using his position in forcing the contractor to purchase this equipment.

As this investigation proceded, it was also brought to light that the contractor was required to pay this engineer additional money in order to obtain his signature on the final estimate of the project. The city engineer of this particular town become involved in the investigation and admitted that he was hired by this engineer to make the necessary survey in the city at the rate of $300 per month for which he received a check, but by mutual agreement he was to refund $200 in cash.

I wish to make it clear that engineers generally are not of this caliber, but as far as I know even with the additional cost to the city for their work and the damage done the engineering profession in this particular instance, there has been nothing done to correct this condition and I know of nothing that would prevent this particular engineer from returning to Kansas and repeating his unethical and crooked schemes. It was through the violation of ceiling prices that this information was brought to light. This malpractice in the engineering profession is still with us. There are at present no means to control such practice in Kansas. In the interest of the engineering profession as well as a protection to the general public, I feel some movement should be started to clear the deficiencies in the profession and place it on a par with other professions of the state.

P.E. Examinations in N. Y. State

In the February 1946 examinations for licensing Professional Engineers in N. Y. State, 228 candidates took the examinations and 154 passed, or 67 percent. In the three parts of the examination, the results were as follows:

Part I (Structural Planning and Design)—97% passed.

Part II (Basic Engineering Sciences)—70% passed.

Part III (Professional Engineering—Practice)—84% passed.

For a Better America

God give us men—leaders, not demagogues — statesmen, not politicians—men who can think honestly and act squarely, placing conviction above flattery, fairness above patronage, and their Country's good above personal glory—men with courage to speak and fight for the truth even at the cost of unpopularity and defeat. —D. B. Steinman.

No modern government ever admits itself to be the "aggressor" in making war. Further than that, military men agree that "the best defense is an offense." Under these circumstances, any attempt in international agreements to penalize "aggressor nations," would seem to be rather futile.

MEMBER STATE SOCIETIES N.S.P.E. — *Officers and Directors*

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D. C.	HERBERT MANUCCIA 3900 Mt. Vernon Ave. (11GWC) Alexandria, Va.	RALPH A. DANE 804 Beverly Dr. Alexandria, Va.	FRED W. L. HILL 6440 Barnaby St., N. W. Washington, D. C.
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OKLAHOMA	C. S. WORLEY 410 Commerce Exchange Bldg. Oklahoma City, Oklahoma	ROGER L. FLANDERS 410 Commerce Exchange Bldg. Okla. City, Okla.	CHARLES S. LARKEY Box 521 Tulsa 2, Oklahoma
PENNSYLVANIA	LeROY F. CHRISTMAN 101 Endlich Ave., Mt. Penn Reading, Penna.	RUSSELL S. CONRAD 29 S. 3rd St. Harrisburg, Pa.	J. J. PAINE 1430 N. Euclid Ave. Pittsburgh 6, Pa. LeROY F. CHRISTMAN 101 Endlich Ave., Mt. Penn. Reading, Penna. RAY M. FULLER 560 No. 16th St. Philadelphia, Pa.
PUERTO RICO	C. CALOR MOTA University of Puerto Rico Mayaguez, Puerto Rico	ANGEL SILVA, Ex. Sec. Dept. of the Interior Santurce, Puerto Rico	SALVADOR QUINONES 20 East Leland Street Chevy Chase, Maryland
RHODE ISLAND	CHAS. E. BLAIS 185 Princeton Avenue Providence, R. I.	VINCENT DiMASE 201 Dean Street Providence, Rhode Island	DANIEL O. CARGILL Box 257, RFD 2 Valley Falls, R. I.
TEXAS	JAMES P. EXUM 704 Texas Avenue Austin, Texas	R. S. GUINN 504 Ewell Nalle Bldg. Austin, Texas	W. M. ANDREWS Union Nat. Bk. Bldg. Houston, Texas HARRY K. RUPP c/o Penna. Shipyards Beaumont, Texas ROBERT COLTHARP 401 E. 31st Street Austin, Texas
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WASHINGTON	JOHN O. JOHNSON 1626 Calif. Ave. Seattle 6, Wash.	DeWITT C. GRIFFIN 717 Lloyd Bldg. Seattle, Wash.	H. C. GLAZE Paulsen Building Spokane, Wash.
WEST VIRGINIA	P. K. PIERPONT 712 College Ave. Bluefield, W. Va.	ROSS B. JOHNSTON, Ex. Sec. Kanawha Hotel Charleston, W. Va.	T. J. JACKSON 1203 Augusta St. Bluefield, West Virginia
WISCONSIN	EDWIN W. SEEGER P. O. Box 464 Milwaukee 1, Wis.	O. J. MUEGGE 656 Crandall St. Madison 5, Wisconsin	L. E. PETERSON 312 E. Wisconsin Ave. Milwaukee, Wisconsin

Kindly report any errors or omissions to the Editor.

National and State Society News

The Emergency Fund

Contributions to the Emergency Fund continue to come in. Some engineers send just their check, but a few write encouraging letters commenting on some phase of the Society's program. President Ritchie Lawrie regrets his inability to personally acknowledge these letters. Following out past custom he asks that we list the names and addresses of those who have written, and whose letters he greatly appreciates. Since last report letters have been received from the following engineers:

Victor E. Roth, 268 Market St., San Francisco, Calif.
O. L. Roscoe, Seattle, Washington.
L. M. Feller, Rochester, Minn.
K. M. McGhie, Rochester, Minn.
Wilfred N. Ball, 300 Montgomery St., San Francisco, Calif.
Arthur J. Widmer, Fullerton Building, St. Louis, Missouri.
H. C. Frankmann, 2207 Knight Road, Houston, Texas.
Harold E. Olson, 1038 Linwood Avenue, St. Paul, Minnesota.
Alex Blair, Lake Placid, Fla.
Frederick C. Teske, 4254 24th Avenue S., Minneapolis, Minn.
Geo. W. Bertilson, St. Paul, Minn.
Fred Manley, 216 12th Street, Knoxville, Tenn.
John R. Skuba, 160 N. LaSalle Street, Chicago, Ill.
J. F. Hughes, Rio de Janeiro, Brazil.
R. G. Webster, Cincinnati, Ohio.
Harry R. Burns, Cincinnati, Ohio.
R. Starr Parker, Cincinnati, Ohio.
H. C. Nutting, Cincinnati, Ohio.
A. W. Paul, Cincinnati, Ohio.
John M. Stoudt, Cincinnati, Ohio.
William F. Ford, Cincinnati, Ohio.
A. B. Backherms, Cincinnati, Ohio.
H. A. Metger, Cincinnati, Ohio.
H. P. Seuerling, Cincinnati, Ohio.
Frank Woods, Cincinnati, Ohio.
C. Hartman, Cincinnati, Ohio.
James Lineback, Cincinnati, Ohio.
Julian E. Tobey, Cincinnati, Ohio.
J. G. Martin, Cincinnati, Ohio.
Chas. McL. Moss, Wilkinsburg, Pa.
Frank L. Raschig, Columbus, Ohio.
Randolph L. Smith, St. Paul, Minn.
A. L. Nelson, Bemidji, Minn.
John B. Walsh, LaGrangeville, N. Y.
B. H. May, Buck Run, Pa.
Howard J. Kirn, Hamilton, Ohio.

Coming Events to be Remembered

Oct. 27, A.M., NSPE Board of Directors Meeting, Statler Hotel, St. Louis, Mo.

Oct. 27, P.M., Joint meeting of the Board of Directors of the NSPE and the National Council of State Boards of Engineering Examiners, Statler Hotel, St. Louis, Mo.

Oct. 28, A.M., NSPE Board of Directors Meeting, Statler Hotel, St. Louis, Mo.

Oct. 28, Evening, Annual Dinner, NCSBEE, at which President Ritchie Lawrie, Jr., of the National Society of Professional Engineers, will speak.

Dec. 6, Third Annual Meeting, Georgia Society of Professional Engineers, Atlanta-Biltmore Hotel, Atlanta, Ga.

Dec. 6, NSPE Board of Directors Meeting, Atlanta-Biltmore Hotel, Atlanta, Ga.

Dec. 7, NSPE Annual Meeting, Atlanta-Biltmore Hotel, Atlanta, Ga.

Please see that the editor of the American Engineer is on your mailing list to receive all Chapter and State publications containing news. We would like to have news from each State in every issue. We attempt to find space for all items having some national interest, such as outstanding activities, addresses by prominent members of the profession, member-campaign methods, records of membership growth, exceptionally successful meetings, etc. We close forms on the 10th of the month previous to date of issue.

The editor welcomes contributions on any topic relating to the professional advancement of engineers. If you have an idea as to ways and means of stimulating the growth of NSPE, methods of making meetings more interesting, or otherwise furthering the social and economic welfare of the profession, we'd like you to get in touch with us.

District of Columbia Society Has Live Annual Meeting

The District of Columbia Society of Professional Engineers shared an excellent dinner with the officials of various local Technical Society Chapters, at its annual meeting on May 27th. The discussions, in which just about everybody present participated, dealt with the professional problems of engineering—their organizational, social and economic welfare.

The meeting was an outstanding success in numbers, in the exchange of good fellowship and in educational values developed out of the very frank discussions. The officials of the technical societies were given an opportunity to talk, and demonstrated that they too had definite ideas about the professional organization of engineers pretty much along the line of those advocated by NSPE.

More Education Needed

Most striking was the amount of misinformation, and often lack of information about the policies as well as about the past and present accomplishments of NSPE. There were prominent members of technical societies present who had scarcely heard of our organization, and still less about our activities on behalf of the professional engineer.

Following the meeting, past and present officers of the D.C. Society expressed themselves as deeply impressed with the opportunity that exists to engage in a campaign of education among local engineers. The discussions may serve to galvanize our local membership in doing some really effective organizational work in the months just ahead.

The main guest speaker was the Assistant Engineer Commissioner for the District, Jos. D. Arthur, Jr., of the Corps of Engineers, U.S. Army. Col. Arthur spoke eloquently of the urgency of the need for a strictly professional organization of engineers, which can speak at all levels for all professional engineers. It was the general consensus that Col. Arthur made a good case for the principles underlying the policy and program of the NSPE.

During a brief business meeting, a fine slate of officers for the coming year was elected as follows: President, Herbert Manuccia; vice-president, C. Warren Bogan; 2nd vice-president, John J. Rockefeller; Secretary-treasurer, Ralph A. Dane; Society directors, Maj. Elmer C. Kautt and Geo. B. Roberts; National Director, Fred W. L. Hill, with J. Raymond Meehan as alternate.

Among the prominent guests from other societies, all officers of D.C. Chapters, were: Ernest T. Walker, chairman, Am. Inst. Elec. Engineers; E. W. Pehrson, chairman, A.I.M. & M. E.; L. S. Smeby, vice-chairman, Am. Inst. of Radio Engineers; Henry Austin, Am. Assn. of Engineers; Frank L. Weaver, President of D.C. Am.

Soc. of Civil Engineers; L. Bert Rye, Jr., president, Am. Soc. Heating & Vent. Engineers; C. A. Batts, president, Washington Soc. of Engineers; Rudolph Michel, chairman, Am. Soc. Mech. Engineers; Thos. F. Coglan, chairman, Illuminating Engineering Society; Thos G. Digges, chairman, Am. Society for Metals, and Geo. Luther, chairman, Am. Welding Society.

Newly elected president Manuccia is already hard at work on plans to organize a functionally efficient set of committees which will bring the importance of membership in the NSPE home to all registered Engineers in the District.

ILLINOIS

The Illinois Engineer will be published during the summer months this year for the first time. This is thought to be worthwhile to keep our members constantly informed.

Several of our State Chapters have asked that the present ten classes of membership be reduced in number. Due to the somewhat contradictory nature of the requests, the Board has made its own proposition to reduce the number of types of members to six. This proposal will be submitted to the membership.

A communication from the NSPE concerning Boycotts will be published in the Illinois Engineer. In Illinois a case has been presented where a union attempted to organize engineers, requiring some necessary steps to preserve the professional standing of registered engineers.

G. F. Barstow, Stillwater, Minn., has resigned from the Minnesota state highway department where he has been employed as an engineer for the past 32 years. He will engage in private engineering practice in Stillwater. Mr. Barstow is a well known member of the Minnesota State Association of Professional Engineers.

Titus G. LeClair, chief staff engineer, Commonwealth Edison Company, and a member of the Illinois Society of Professional Engineers, has been elected president of the Western Society of Engineers. He was inducted at the annual dinner meeting of that society on June 2, in Chicago.

MINNESOTA

Thomas G. Odegard, formerly with the Minnesota State Highway, has been appointed county engineer for Lake County.

V. T. Kenna, of Virginia, is new county engineer for Cook County.

Ralph Sprungmen has returned to his duties as senior traffic engineer in the Minneapolis city engineer's office, after serving three years with the Army transportation corps as major.

Warren Sleeger, of St. Paul, has resigned as assistant engineer of the Minneapolis-St. Paul sanitary district to become civil engineer with the Veterans Administration. He will work on plans for a new hospital and administrative facilities.

Galen J. Jasper of the Twin City Testing Laboratories has been chosen chairman of the Minneapolis Atmospheric Pollution Committee (the Mayor's smoke prevention committee). Professor R. E. Summers of the University, is the group's secretary.

Colonel Bettenburg reports that his committee had a discussion with officials of the City of St. Paul, with the result that there now is a tentative agreement that when the city charter calls for an "engineer," a "professional engineer" will be specified.

NEW JERSEY

The Passaic Chapter of the New Jersey Society of Professional Engineers has received wide commendation, in the local press and otherwise, for its leading part in bringing the flood prevention and control issue before the community. On the evening of March 21st, this Chapter promoted a meeting at Lambert's Castle, in which Col. Charles K. Panish, of the War Department Civil Engineering Department, was the speaker on this subject.

The New Jersey State Board of Professional Engineers and Land Surveyors has issued a total of 5,548 licenses to Professional Engineers and/or Land Surveyors during the years of its existence, 1922 to 1945 inclusive In 1945, 311 licenses were issued, which is the largest number granted in any year since 1923. During the first six weeks of 1946, 162 new aplications were considered.

A bill to amend the present State registration law in New Jersey to provide for "engineers-in-training" is awaiting Governor's Edge's signature as this is being written. On April 22, 1946, Governor Edge signed a new law, known as the Preiser bill providing for the preparation of a uniform building code for the sale for use by state agencies and local municipalities. This legislation was jointly sponsored by the N. J. Society of Professional Engineers, the N. J. Society of Architects, the Building Inspectors' Association of New Jersey, and the Building Contractors' Association of New Jersey.

NEW YORK

At the Annual Meeting of the New York State Society of Professional Engineers, the cash on hand as of May 1st, 1946 was reported as $14,242.78, as compared with $8,559.56 the same date in 1945. Active membership as of April 20th, 1946 was reported as 2,051, as compared with 1,917 as of one year previous.

Engineer Professor A. E. Wessman, a member of the Bronx County Chapter, has proposed a State Society Educational Committee. This resolution was approved at the May meeting and is now being considered by the Executive Committee.

On June 6th, the Bronx Chapter entertained with a dinner at the Concourse Plaza Hotel, followed by an illustrated lecture, with slides and radio transcription by Dr. David B. Steinman. As usual, Dr. Steinman's address and dramatic presentation of "The Builders of the Bridge," proved intensely interesting.

The last regular meeting of the Kings County Chapter until fall, was held on June 20th.

Engineer A. N. Friedman, of the Kings County Chapter, has recently joined the firm of Leonard S. Wegman & Company, Consulting Engineers, at 9 East 45th Street, New York City.

The New York County Chapter celebrated its eighth anniversary, at a dinner meeting held at the Advertising Club, 23 Park Avenue, New York City on June 7th.

The Erie County Chapter of NYSPE has initiated a movement to have the 1947 convention of the National Society of Professional Engineers at Buffalo. A committee has been appointed to work out a proper procedure. At the May meeting of the Chapter, a gain of 20 members was reported to a new total of 196.

The Annual Meeting of the Albany County Chapter meeting was addressed by the State Society's Executive Secretary, Frank J. G. Duck, May 21st.

The membership drive for the 12 months ending April 20, 1946, went to Suffolk County Chapter, with an increase of 35 active members, or 109 per cent.

More than 75 members attended the annual meeting of the Kings County Chapter, at which the following officers and directors were elected for the coming year; President Carl M. Gilt, First Vice President Charles W. Mitchell, Second Vice President Gustave Freeman, Treasurer Paul Klepper, and Secretary Irving J. Lake. The six directors also elected are: Clifford W. Valentine, Arthur A. Vioni, Jay F. Krakauer, Leslie Wax, Simon Ryder, and William Spivak.

A special feature of this meeting was the presentation of appropriately inscribed scrolls to the following past Chapter Presidents: John C. Riedel, James F. Fairman, Louis A. Walsh, James F. Fouhy, Joseph Vertefeuille, and Charles W. Franklin.

The officers and directors were installed by Engineer Riedel, while the scrolls were presented by William H. Larkin, First Vice President of the New York State Society.

The Chairman of the several standing committees are: Leslie Wax, Membership; John G. Foley, Program; Arthur A. Vioni, Legislative; Max Isaacs, Public Relations. In addition to these our Chapter also boasts of a Post War Planning Committee, headed by Dr. Jay F. Krakauer; and one on Codes and Buildings, headed by Benjamin Saltzman, Chief Engineer of the Department of Housing and Buildings in Kings County.

Our Membership Committee, under the Chairmanship of Engineer Wax, has initiated a comprehensive program, which has the approval of the Board, designed to interest every licensed engineer in the aims and objectives of our organization, leading ultimately to a substantial increase in our membership rolls.

The second largest Chapter in this State, we are justly proud of having contributed in no small measure to the progress of the State as well as the National organization, and with the untiring efforts of our Committees and the aid of our general membership we should reach our goal without difficulty.

OHIO

The Board of Trustees of the OSPE voted on June 7 to give authority to three alternate National Directors to represent the Ohio Society when the regular Director, Mr. J. S. Kennedy is not present. The three alternates designated were: John F. Hale, W. W. Graf and/or William C. Kammerer.

The registration of engineers in Ohio has increased very rapidly during the past six months. By December 31, 1946, the number is expected to reach a total of 12,600, as compared with 8,855 in the 1944 Roster. The Ohio Society of Professional Engineers feels that its organization must represent at least half of the total number of registered engineers in order to get the desired support from both State and National legislative bodies. For this reason, active membership campaigns must be continued with increased vigor.

The Ohio Society of Professional Engineers has issued an attractive, 8-page brochure entitled "The Professional Engineer and his Organization, and why you should belong."

The application for membership blank in use by the Ohio Society is somewhat unique in that it requires the applicant to list the technical societies in which he holds membership. Also the applicant's major duties in his present position, and his responsibilities in the position which he occupies, are to be checked. It is highly desirable the Society know as much as possible about new members, if for no other reason than that this information indicates in what capacity new members may serve the Society after they are admitted.

The Akron Chapter, through hard-working membership chairman Heiberg, boasts of two months' maintenance of first place in the drive for new members. A goal of 25 new members a month has been set.

The Marion Chapter has statistics to prove its claim to the largest percentage of members to the total number registered, of any Chapter in the State. At a recent meeting the attendance was 80 out of a membership of 86.

The 1947 convention of the Ohio Society has been set for March 20-21-22, at the Deshler-Wallick Hotel, Columbus.

A proposal is being considered by the Dayton Chapter, which involves starting a friendly suit with the telephone company, enjoining them from accepting any illegal listings of engineers in the telephone directory.

The regular monthly dinner of the Board of Trustees of the Ohio Society was held on June 7th, at Columbus. There were 26 engineers present, representing 15 of the 27 Chapters. Net financial balance was reported at $6,495. 75, compared with $9,000.31 a year ago. The net increase in the membership for May was 31, bringing the total to 2,998.

The Northeast Chapter sent a check for $78 to the National Society Emergency Fund, through the OSPE office. It is understood this is the first contribution sent in in the name of a Chapter of a State Society. There is no reason why it should be the last such contribution!

OKLAHOMA

Col. Philip S. Donnel, Dean of Engineering at Oklahoma A. and M. College was presented with the Legion of Merit with appropriate ceremonies on May 3rd, for distinguished services performed in the European Theater of War.

Lloyd E. Elkins, assistant chief production engineer, Standard Oil & Gas Company, has retired as chairman of Mid-Continent Section of A.I.M.E. and has assumed the office of vice-president in charge of membership of the Engineers' Club of Tulsa.

Kenneth G. Pearce, recently released from the Navy, has been made assistant to the gasoline supervisor, production department, with the Carter Oil Company.

PENNSYLVANIA

On July 3rd the financial pages of Philadelphia newspapers carried a display announcement addressed to "All Engineers" and to "Citizens", advising them of some of the chief provisions of the new Pennsylvania Engineers Licensing law, taking effect, July 1, 1946. This advertisement was inserted by the Pennsylvania Society of Professional Engineers.

To the Engineers the announcement read in part:

"Under the new law it is unlawful to any person to engage, or to offer to engage in the practice of engineering in this Commonwealth unless he is licensed and registered under the laws of this Commonwealth as a professional engineer . . ."

"The Supreme Court has ruled that a contract to perform engineering service, under the style and designation reserved exclusively for members of the two professions (Engineering and Architecture), is in violation of the Acts of Assembly regulating the subject.

"Briefly, if you are practicing engineering, you must be licensed and registered, and if you are not registered, do not offer to practice, or assume the title 'Engineer' with or without qualifying adjectives."

To the Citizens, the announcement read in part:

"The new law has been designed to safeguard your life, health and property. Registered Professional Engineers are issued an identification card by the Commonwealth, must display a license certificate in their office, must sign and seal their documents. You are urged to cooperate in the enforcement of this law by reporting all violations. If desired your information will be treated confidentially."

The PSPE has placed display advertisements in a number of newspapers throughout the state annoouncing the effective date of the State's new Registration law for engineers. The announcements point out to engineers the necessity of registration, and to the public, the importance of dealing only with registered engineers on engineering matters.

Charles Haydock, past-president of the Philadelphia Chapter, PSPE, has been appointed, by Governor Martin, as a member of the State Board for the Registration of Professional Engineers and Surveyors. He will fill the place vacated by the death of Carroll R. Thompson, of Philadelphia.

Engineer Donald Peters, a member of the Pittsburgh Chapter, has been made secretary of the Mayor's Committee to revise the Pittsburgh Building Code. Some fifteen other Engineer Members will be associated with Mr. Peters, as members of sub-committees working on the project. It is expected this work will be completed sometime this fall.

State President LeRoy F. Christman has been active around the Western part of the state. Pittsburgh, Johnstown and Erie Chapters were among those visited recently.

The Executive Committee of the Pennsylvania Society of Professional Engineers met in Harrisburg, on June 21st. The Executive Board met on June 22nd.

President Ritchie Lawrie, Jr., and Pennsylvania State president LeRoy Christman, spoke at a special meeting of the Pennsylvania Society at York, on May 27th. More than 100 registered Engineers attended. Steps were taken following the meeting which may lead to the formation of a new Chapter to include engineers from Lancaster, York, Adams and Franklin Counties.

TEXAS

The Texas Society of Professional Engineers has passed another milestone in its path of progress. On July 1st, a full time Executive Secretary takes office. This is the attainment of an objective which has occupied first place on TSPE'S program for several years. The man selected for the position is John J. Ledbetter, Jr. He is a registered Professional Engineer, a member of the American Bar Association and a member of the State Bar of Texas. For fourteen years Mr. Ledbetter practiced engineering. He then qualified as a lawyer to be able to better conduct the affairs of his engineering office. For the five years he was in the army, his work was legal, labor relations and public relations.

At the President's Conference, held in Columbus, Ohio in March, Texas Society President James Exum challenged the president of the New Jersey Society, Daniel M. Kramer, to a membership drive contest. How enthusiastically the New Jersey engineers accepted the challenge is shown by the following announcement appearing in a recent issue of the New Jersey Engineer, the Society publication of that State:

"Beat Texas. Pitch in right now . . . Help to pass the 2,000 member GOAL. For 1946, NJSPE need . . . 100% renewals, 100% new members. EVERY MEMBER GET A MEMBER."

It's up to every Texas engineer to show the folks up in New Jersey that Texas doesn't wind up in second place any time two states are concerned.

The formation of a new Chapter of the Texas Society of Professional Engineers, is being promoted at Lubbock. H. N. Roberts has been named temporary chairman.

Texas Engineers regretfully learn of the passing, on May 31, of Henry Cyrus Porter, research engineer in the Texas Highway Department. Mr. Porter will always be remembered as one who gave active support to the program of the Texas Society of Professional Engineers, and as a man in every way a credit to his profession.

Recently the Travis Chapter held a novel meeting at which doctors and legislative candidates were the honored guests and whose speeches re-

placed the usual order of business. This live Chapter plans a meeting with the lawyers of the area in the near future.

The Sabine Chapter at Beaumont has started the "Sabine Engineer," its first issue published in April. It is a four page, four column newspaper, containing pictures, news and advertisements.

The Texas Society has a program under way known as, "Know Your Legislators." In line with this program, Chairman O. A. Philippi, of the Chapter Activities Committee invited all candidates for the State Legislature to its May 16th barbecue. All Chapters are being asked to furnish this committee with copies of Chapter bulletins, as in setting up a clearing house of Chapter activities throughout the state.

Engineer T. C. Forrest told a recent meeting at Waco that in Houston, the C.I.O. Union had organized there with 15 charter members and that 15 more engineers had joined the group subsequently. He pointed out the need for immediate action to solve the problem of engineers' unionization.

WEST VIRGINIA

Charles Snyder, of Fairmont, president of the State membership committee, spoke at the May meeting of the Huntington Chapter. His topic had to do with methods of increasing membership and his remarks were well received. A resolution was introduced at the meeting that the secretary extend an invitation to the State Society to hold its next Annual Meeting in Huntington.

George W. McAlpin, chief construction engineer for the State Road Commission, is the new president of the Charleston Chapter. John G. Henderson is the retiring president.

At the May meeting of the Mingo Chapter, it was agreed to have the Chapter sponsor a drive to get all eligible engineers to register. A special registration committee was appointed.

The Parkersburg Chapter has been successful in getting the local Carnegie Library to install ten volumes, as the first step in a Chapter-sponsored project of establishing a technical section in the library. This is an idea that can be copied in many Chapters throughout the country.

The Columbia Gas and Electric Corporation, which serves much of West Virginia, recently announced an extensive construction program, estimated to cost more than $50,000,000. The company has also announced the advancement of various members of its executive staff. This program, which is planned to extend over the next three years, is designed to assure continued gas service to the 1,285,000 domestic, commercial and other consumers throughout the area.

Road Commissioner E. L. Worthington has announced the appointment of Harry Radcliffe, assistant state maintenance engineer, as administrative assistant—a new post. Mr. Radcliffe has been with the Commission since 1923.

WISCONSIN

Engineer B. E. Miller, secretary of the Wisconsin Power & Light Company, Madison, Wis., and a member of the Wisconsin Society of Professional Engineers, has been elected president of the Wisconsin Utilities Association. Mr. Miller succeeded M. H. Montross, who became chairman of the Association's advisory committee.

Mr. Miller joined the Wisconsin Power & Light Company in 1925, as manager of the rate department. He became the company's secretary in 1932. From 1916 to 1925 Mr. Miller was with the Public Service Commission of Wisconsin, in the engineering rate and research division. Previously he taught engineering at the University of Wisconsin Engineering school, for five years.

The Fox River Valley Chapter is growing and expects to have three more Chapters operating before the end of the year.

The Wilson State Registration Board of Architects and Professional Engineers approved the application of thirty-four engineers for registration under dates of November 9, 1945 and January 7, 1946. It is expected that most of these new registrants will become members of the WSPE without much delay.

The State Public Relations Commitee of the Wisconsin Society of Professional Engineers has been working to improve the telephone listings of engineers. The committee has been partially successful in obtaining recognition of the term "Professional Engineer," in local telephone directories.

The membership committee of the Wisconsin Society of Professional Engineers reports a net membership in good standing as of December 31, 1945 of 494. This represents a healthy increase over the same record for one year earlier.

Hugo E. Bothe has announced his association with Peter R. Verkon, under the firm name of H. E. Bothe and P. R. Verkon, Architects and Engineers, with offices at 5533 Sixth Avenue, Kenosha.

G. P. Feierbend, formerly with the Wisconsin Bridge & Iron Company, is now associated with C. C. Banholzer, doing business under the name of C. C. Banholzer and G. P. Feierbend, with offices at 728 No. Jefferson St., Milwaukee.

Franklin T. Matthias has accepted a position as project manager for the Sao Paulo Tramway Light and Power Company, Ltd., at Sao Paulo, Brazil, on a hydro-electric expansion construction project. Before his discharge from the Army Col. Matthias was with the atomic bomb project at Pasco, Washington.

Samuel J. Gates and Parker Moe, members of the WSPE, have associated themselves under the firm name of Gates, Moe and Weiss, consulting Engineers, with offices at 611 No. Broadway, Milwaukee.

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What's New For Engineers

Requests for further information concerning any item mentioned under this heading will be promptly referred to the manufacturer. It would be appreciated if inquiries be addressed on professional or company letterhead.

Send Inquiries Direct to American Engineer, #6 Church Street, New York, N. Y.

NEW VAPOR DEGREASER

Small basketed parts are cleaned in a new two-dip immersion vapor degreaser recently announced, permits a choice of any of several cleaning cycles. The type and degree of soil contamination is the deciding factor in the selection of the appropriate method of cleaning. The first choice is an immersion-vapor cyle. Work being cleaned is dipped in hot solvent in the first chamber and then is moved through vapor in the second. A second selection is a vapor-immersion-vapor cycle. Here, the solvent level is held low in the first chamber allowing the accumulation of oils and grease as in a one-dip concentrator. The conveyor moves through hot solvent in the second chamber and then through solvent vapors in the final phase. The boil-rinse-vapor cycle cleans the work in solvent at a boil temperature, at a rinse temperature and in the vapor. Some contaminants can be removed in vapor alone. These various phases can be recombined to form new cycles for special degreasing jobs.

For further information address American Engineer, reference No. 499

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WHEELABRATOR TUMBLAST

Complete information on the new 60"x96" Wheelabrator Tumblast is contained in catalog No. 264 just published by this manufacturer. The 60"x96" is the newest addition to the standard line of airless blast equipment manufactured by this company

For further information address American Engineer, reference No. 500

NEW CALL-BACK UNIT

This new call-back and sound reproducer unit has been designed especially for use with high noise level coverage industrial communication systerms. The manufacturer states that it is used with combination intercomand amplified voice-paging systems having any number of fully intercommunicating master stations, trumpet speakers, and other standard reproducers. This call-back unit doubles the efficiency of the intercom-paging system by reproducing the paging call clearly and distinctly and by permitting the person called to reply and converse directly with the executive originating the call. To page, the executive depresses the paging button on his master station and calls by name the person he wishes to locate and speak to. The amplified paging call is reproduced by trumpet speakers and give complete high fidelity voice coverage of the entire office, plant, or factory area. On hearing his name called, the person paged approaches a conveniently located call-back reproducer station, depresses the key and automatically is connected directly to the executive who originated the paging call. All other amplified reproducers and call-back units are automatically silenced while the two-way conversation is in progress.

For further information address American Engineer, reference No. 501.

AIR-DRAULIC CYLINDERS

A 16-page illustrated catalog announcing the new standard "Air-Draulic cylinders and containing valuable engineering data is offered by this manufacturer. The new "Air-Draulic" operating principle is clearly described in the catalog. The book explains how to utilize its advantages in a wide range of machine tool, manufacturing and processing applications, and gives complete engineering specifications. Copies of the catalog are free when requested on a company letterhead.

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Three new cutting oil bases for use in the metalworking trades, including a unique, extreme pressure cutting oil base in which sulphur and chlorine are combined in non-corrosive form, have just been developed in the research laboratories of this company. Recommended for steel, brass and copper cutting operations in which frictional loads are extremely high, it is a specially prepared fatty oil base containing a high content of equal parts of sulphur and chlorine the company stated. Absolutely odorless and free from tarry matter, it blends in all proportions with any diluent petroleum oil, down to required viscosity, sulphur and chlorine specifications. A powerful suphurized cutting oil base and a soluble cutting oil base, also have been developed. The former contains 15 per cent sulphur in both chemical combination and active form, and is recommended for straight cutting operations on ferrous metal.

For further information address American Engineer, reference No. 503.

UNIVERSAL TESTING MACHINES

This manufacturer announces the publication of catalog No. 30 covering the company's entire line of Universal Testing Machines for tension, compression, and flexure testing. Included in this illustrated, 56-page catalog is a complete description of the principle and operation of the Olsen pendulum lever weighing system, hydraulic and electro-mechanical loading systems, testing ranges and specification details on machines ranges from 1,000 to 1,000,000 or more pounds.

For further information address American Engineer, reference No. 504.

"REFRACTORY SPECIALTIES"

Anyone concerned with refractories and furnace construction will find helpful reference material in this new catalog and data book entitled "Refractory Specialties." This book contains numerous cross-sectional drawings, charts, graphs, technical illustrations, definitions of terms, formulas, temperature conversion tables, properties of gasses and other data . . . in the field of refractories and their applications.

For further information address American Engineer, reference No. 505.

SIL-VAR INSULATING COATING

This manufacturer announces a new folder on their product Sil-Var. The manufacturer claims that Sil-Var is a remarkable insulator in which the excellent heat and light reflecting value of aluminum plus the unusual acid, alkali, corrosive fume, and water repellence of mineral asphalt has been combined as one, in a duplex coating. Sil-Var may be applied by brush, dip or spray.

For further information address American Engineer, reference No. 506.

TAP EXTRACTORS

This new folder just released by this manufacturer emphasizes the following points on their tap extractors: 1. A complete range of extractor sizes for standard hand taps, for machine screw taps, and now for pipe taps; 2. Simplicity of operation; 3. Immediate delivery from stock: and 4. Free reconditioning service.

For further information address American Engineer, reference No. 507.

DUST CONTROL EQUIPMENT

A new bulletin describing dust control equipment. The new booklet contains many installation photographs, tables, charts and a discussion of a simplified procedure for designing exhaust systems. Also included is an explanation of pressure relationships in an exhaust system and methods of measurement.

For further information address American Engineer, reference No. 508.

PRINTLOID PLASTICS

A catalog graphically illustrating the saving in time and money of highly unusual operation. This company offers all of the four vital steps in plastic production, including forming, printing and die cutting: machining: design and assembly.

For further information address American Engineer, reference No. 509.

MAGNETIC HOLDING METHODS BOOKLET

This 24-page booklet just released by this manufacturer provides information on material holding that will be of practical help to those seeking ways and means of bettering the output of men and machines in ther plants.

For further information address American Engineer, reference No. 510.

THERMOMETERS AND HYDROMETERS

Release of a new catalog covering their entire line of Etched Stem Thermometers and Hydrometers. This catalog contains a full listing of the line, with illustrations of the products and the method of manufacture.

For further information address American Engineer, reference No. 511.